THE

## RURAL ECONOMY

OF

## YORKSHIRE.

COMPRIZING THE

Management of Landed Estates,

AND THE

PRESENT PRACTICE of HUSBANDRY

IN THE

AGRICULTURAL DISTRICTS

By Mr. MARSHALL.

THE SECOND EDITION.

IN TWO VOLUMES.

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FROM Norfolk\*, I passed, in November 1782, through Lincolnshire, into Yorkshire: where I spent six months; principally, in observing and registering its Rural Practices: a task I was the better enabled to perform, in so short a time, as my early youth was spent among them; and my acquaintance, with the present Practitioners, extensive.

When I left the County, in May 1783, I considered myself possessed of Materials sufficient for the purpose, which I had at that time in view. But, on digesting my papers (after I had seen the Practice of Norsolk through the Press), I found many additions wanting, to render my Register sit, as a separate Work, for the public eye. I therefore paid this Country a second agricultural visit, in March last, (1787;) and have made a

See the Preface to the RURAL ECONOMY of NORFOLK.

farther stay in it of nine months: during which time, I have not only filled up the deficiencies, I was aware of; but have received a greater influx of fresh information, than I had any reason to expect.

It was my intention, when I came into the County, to have made excursions, into its feveral Districts; but having found, in the immediate environs of the STATION, full employment for the time appropriated to the County, I am under the necessity of postponing the intended excursions. I postpone them, however, with less regret; as, in acquiring a general knowledge of the RURAL ECONOMY of the KINGDOM, the primary object is to obtain, with fullness and accuracy, the widely differing Practices of STATIONS, chesen in DISTANT DEPARTMENTS. The partial excellencies of INTERMEDIATE DIS-TRICTS, howfoever defirable they may be, are objects of a secondary nature.

PICKERING, 21 December 1787.

PUBLISHED, March 1788.

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## SECOND EDITION.

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THE Surveys that have recently been made, under the Direction of the BOARD OF AGRICULTURE, have precluded the necessity of extending my Examinations, in this County.

I have, however, purposely refrained from profiting by these Surveys, in this Edition; as it is my intention to go through the whole of the Board's Reports, analytically, and to select such Notices, and Particulars of Practice, as may have escaped my own Observations, in the several Departments of the Kingdom. Indeed, it has been my desire, in revising these Volumes, to compress them, rather than to enlarge their bulk, and to confine

own Observations on the established Practices of this Department.

For, it may be proper to remark, that, at the time these Volumes were written, the Completion of my General Defign was in a state of great Uncertainty. I was therefore the more anxious to inftil into them the practical Ideas, which a length of experience had furnished, but which had not been previously registered; and the precarious state of my health, at that time, was another. motive for my wishing to incorporate them with the Practice I was then registering; more especially, perhaps, as it was the Practice of my native Country. But on revision, I have found them, in general, fo firmly engrafted on the provincial practice of the District, as not to be separable from it, without violence. Some general Observations on the Extirpation of Weeds, being the chief part of the adventitious matter. I have been able to separate, with strict propriety.

However,

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However, in profecuting this deliberate Revifal, I have been attentive to improve the general ARRANGEMENT of the Work, and have made fuch other Corrections and Alterations, as Time and increasing Experience have enabled me to make.

To each Volume, I have now prefixed an ANALYTIC TABLE OF CONTENTS; as well to give the Reader a comprehensive View of the general Subject, with its various Divisions and Ramisscations, as to lighten, as much as possible, the Labor of Reference.

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## RURAL ECONOMY

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## YORKSHIRE

## THE COUNTY

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DIVIDED INTO

NATURAL DISTRICTS.

YORKSHIRE has always been spoken of as the first Province of these kingdoms. If we consider its superior magnitude; the variety and strength of its natural features; the fertility of its soils; and the industry of its inhabitants; the abundance and copiousness of its rivers; the richness of the views on their banks; and the wildness of those which are found among its mountains;—it is well entitled to pre-eminence.

Vol. I.

B

Viewed

Viewed as a field of RURAL ECONOMY, it is divifible into MOUNTAIN, UPLAND, and VALE. The VALE OF YORK, falling gently, from the banks of the Tees, down to the conflux of the Trent and Humber, is Nature's grand division of the County, into EAST and WEST YORKSHIRE.

WEST YORKSHIRE naturally subdivides into mountains, which I shall term the Western Morelands; into Craven, a fertile corner cut off from the county of Lancaster; and into a various manufacturing District: EASTYORKSHIRE into Cleveland; the Eastern Morelands; the Vale of Pickering and its surrounding banks; the Wolds; and Holderness.

The WESTERN MORELANDS are links of the extensive chain of mountains, which rife with the Staffordshire Morelands, and continue through Derbyshire, Yorkshire, Westmoreland, and Cumberland, with but few interruptions, to the Highlands of Scotland. These mountains are covered with heath: but the vallies, which intersect them, are cultivated. Wensleydale, the largest of these vallies, is fertile; and abounds with romantic scenery.

CRAVEN

CRAVEN is well cultivated, and ich in foil, but not uniformly so; its surface being broken: it is neither a valley, a vale, nor a plain; nor does it fall under the idea of a mountainous or an upland country. It is small, compared with the other Districts of West Yorkshire.

The MANUFACTURING DISTRICT is strongly seatured. The northern and western parts of it mix with barren mountains. The more southern and eastern limb,—a lovely declivity shelving gently into the Vale of York—is rich and highly cultivated; excepting the most southern extremity, which partakes of the sandy hills of Nottinghamshire; and excepting the mountains on its western margin, which assimilate with those of Derbyshire.

The VALE OF YORK is various in fertility. The fens at its base, and a heathy plain, part of the ancient forest of Galtres, northeastward of the city of York, are drawbacks from its productiveness. In a general view, however, it has not, in this country, its equal. The vales of Gloucester and Evesham are more fertile, but less extensive. The wide stat of country which lies between the hills of Surrey and Kent, and the Downs of Sussex,

may we with it in extent, but not in general ferality. If we estimate the Vale of York by the number and copiousness of its rivers, and by the richness of its marginal banks, it would, perhaps, be difficult to equal it, in any country.

CLEVELAND is, in general appearance, a continuation and appendage of the Vale of York; there being no other natural division between them, than what is given by an unperceived elevation of surface. The waters of the Vale of York fall into the Ouse and Humber; those of Cleveland into the Tees; which divides it from the county of Durham.

The EASTERN MORELANDS appear as a detached mass of mountain, broken off from the British Alps which have been mentioned. The northwest limb of this fragment is an abrupt broken precipice:—at the top, a barren heath:—at the foot, the Vale of York, and the fertile plains of Cleveland. From the brink of this giant precipice, the Morelands dip gently southward to the Vale of Pickering; on whose verge rise, abruptly, a range of thin-soiled limestone heights; which, in a similar manner, shelve gently into the Vale; forming its northern margin.

The VALE OF PICKERING is a fingular passage of country. A lake left dry by nature. A bason, formed by eminences on every side, save one narrow outlet of the waters, collected with in its area, and upon the adjacent hills. Nature, perhaps, never went so near to form a lake, without finishing the design. A dam of inconsiderable length across the Derwent, near Malton, would deluge the entire Vale; and the first passage of the waters would, in all probability, be down the sea cliss, which are its eastern extremity.

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\* Nevertheless, this natural unity, which, as a District, is not to be equalled in the Island, for entireness, regularity, and distinctness of outline, has heretofore been nameless! The principal part of it lies within the Hundreds or Weapentakes, of PICKERING LITHE and RYDALL; both of which extend over and include large portions of the Eaftern Morelands,—a mountainous barren Country, while a small part of it (south of the Derwent) lies in the eastern Division of the County. In the Treatise on Planting, &c. published some years ago, I named it the Vale of Derwent; but to this there was an objection; as the Derwent and the Rye (a branch of the Derwent) are common to the District: beside, it has been the practice of our ancestors to name similar passages of country, from towns which belong to them; as the VALE OF AYLES-BURY, the VALE OF EVESHAM, the VALE OF TAUN-TON, &c. And waving the privileges of antiquity and

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The WOLDS of Yorkshire appear as if, during some convulsion of nature, they had been severed (by the sea-like Humber and its broad rich banks) from those of Lincolnshire. In the present state of things, they may be confidered as the main link, broken off from the chain of chalky hills, which is thrown irregularly over the more fouthern provinces. The Yorkshire Wolds are the Downs of Surrey, on a large scale. They are the most magnificent affemblage of chalky hills the Island affords. The features are large; the furface is billowy, but not broken; the fwells resembling Biscayan waves half pacified. The ground in general is peculiarly graceful: Wood and water would render it most beautiful. Water is forbidden: but wood may be had at will: and it is extraordinary that the spirit of planting should have broken out so late. Utility, as well as ornament, calls loudly for this obvious improvement.

HOLDERNESS, towards the Humber, is a low flat tract: the Marshes of Lincolnshire

on

royalty, which attach themselves to PICKERING; it claims, by its central situation, and the extensiveness of its own parochial rights to the lands of the Vale, the distinction I have here affigned it. (1796.)

on a reduced scale. But the more central parts are diversified in surface, and the upper margin, which forms the skirts of the Wold hills, is a lovely line of country. On one hand a fertile vale, abounding with wood and water: on the other, dry airy downs, rising, with an easy ascent, to the highest Wold.

THE COUNTY CONSIDERED, AS A SUBJECT OF RURAL SURVEY.

IN RIVERS, the County under furvey is The HUMBER, fingularly well fupplied. which might well be styled the RIVER OF RIVERS, bounds it on the fouth. The TEES forms its northern confine. The Don, the AIR, the WHARF, the OUSE, and the DER-WENT rife in its mountains, and wind through its plains. In a COMMERCIAL light, these rivers are objects of the first magnitude. The tide flows into the center of the county, Not only Hull, but York, Tadcaster, Ferrybridge and Doncaster, may be called INLAND PORTS. The Don is rendered navigable, to Rotherham, Sheffield; the Air, to Leeds, Bradford; the Calder, to Wakefield and to near Halifax; the Ouse, to Burroughbridge; the Derwent, to Malton; the Hull, to Driffield,

at the foot of the Wolds; and the Tees, to Yarm, on the borders of Cleveland, at the head of the Vale of York.

If, with the natural advantages this county possesses in its rivers, we view those which are given it by its MINES of coals, allum, iron, lead, copper; and its MANUFACTURES of woolens and iron wares; commerce appears to be singularly indebted to it; while to the SEA PORTS of WHITBY and SCARBOROUGH—as nurseries of hardy seamen—the nation at large owe much.

But national policy and commerce make no part of the present design; unless when they are intimately connected with RURAL ECONOMICS. It therefore remains to view the county, as a subject of RURAL ECONOMY.

No country entirely mountainous, nor one which is disturbed by manufacture, can be a sit subject of study, for rural knowledge. The WESTERN DIVISION of the County falls, chiefly, under one or other of these descriptions. There are no doubt lands, in West Yorkshire, which are highly cultivated; especially about Doncaster, toward Ferrybridge; a passage worth perusing.

NATURAL AND ACQUIRED ADVANTAGES
OF EAST YORKSHIRE.

But if we attend to the EASTERN DIVIsion, we shall find collected, within comprehensive limits, almost every description of country which is interesting in rural affairs. A rich, well cultivated plain; a group of almost barren mountains, inviting objects of improvement; a fertile vale, various in soil and cultivation; with a tract of chalky downs, terminating in a rich marshland country: including grass land of every class, and arable land of almost every description. It is the Island in miniature.

Nor do these NATURAL ADVANTAGES, alone, render East Yorkshire a desirable object of study: the INDUSTRY OF ITS INHABITANTS makes them peculiarly attentive to MINUTIAL matters; while the SPIRIT OF IMPROVEMENT, which has lately diffused itself, among all ranks of men, renders this District singularly eligible, as a field on which to trace the greater OUTLINES OF MANAGE-MENT.

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### VALE OF PICKERING.

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### INTRODUCTORY VIEW

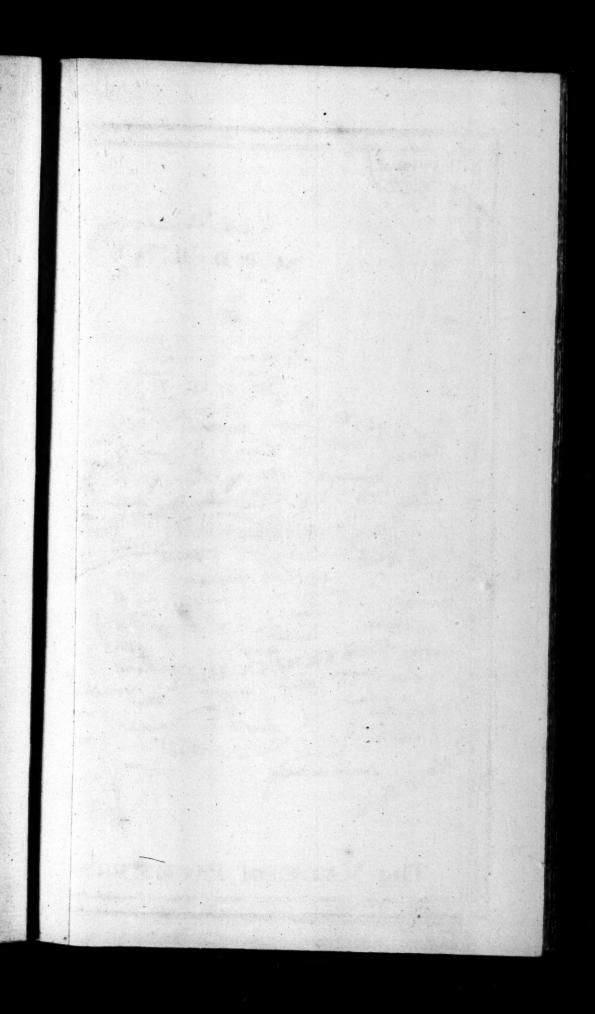
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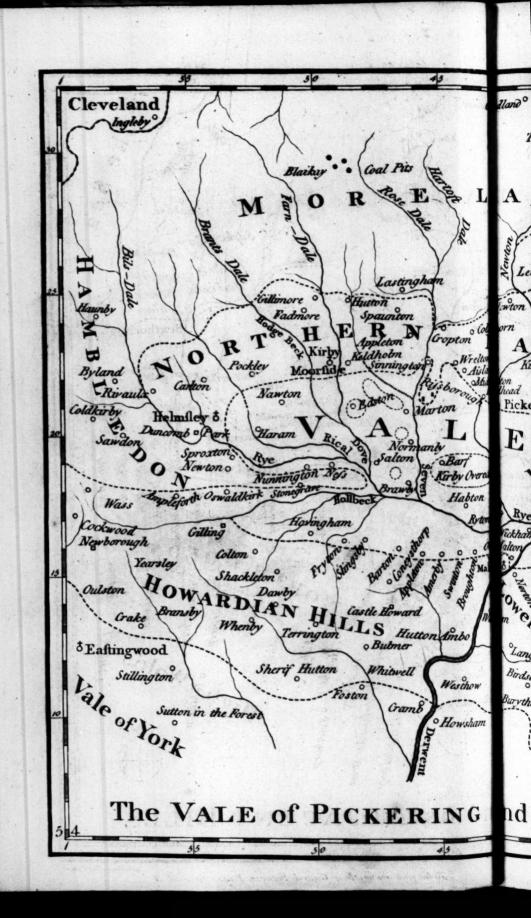
## THIS DISTRICT.

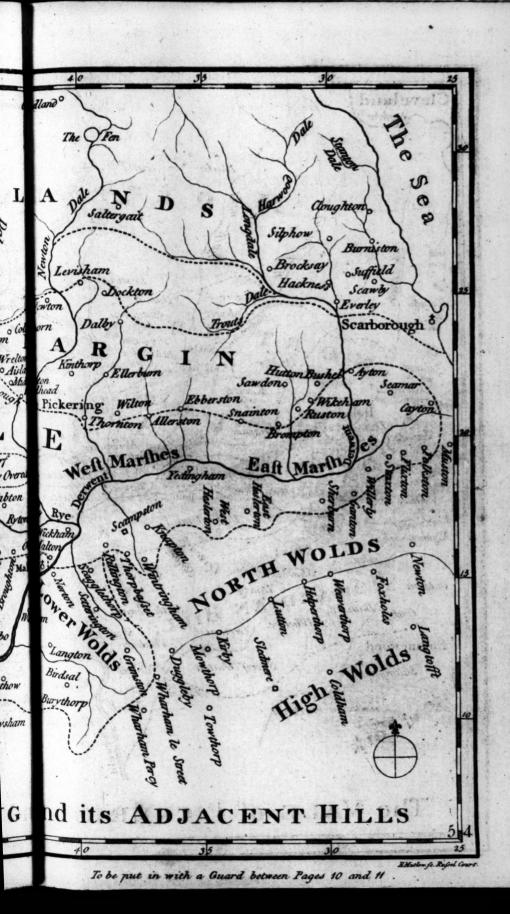
I. SITUATION, The fituation of this division of East Yorkshire has been already given. Its OUTLINE is somewhat oval.

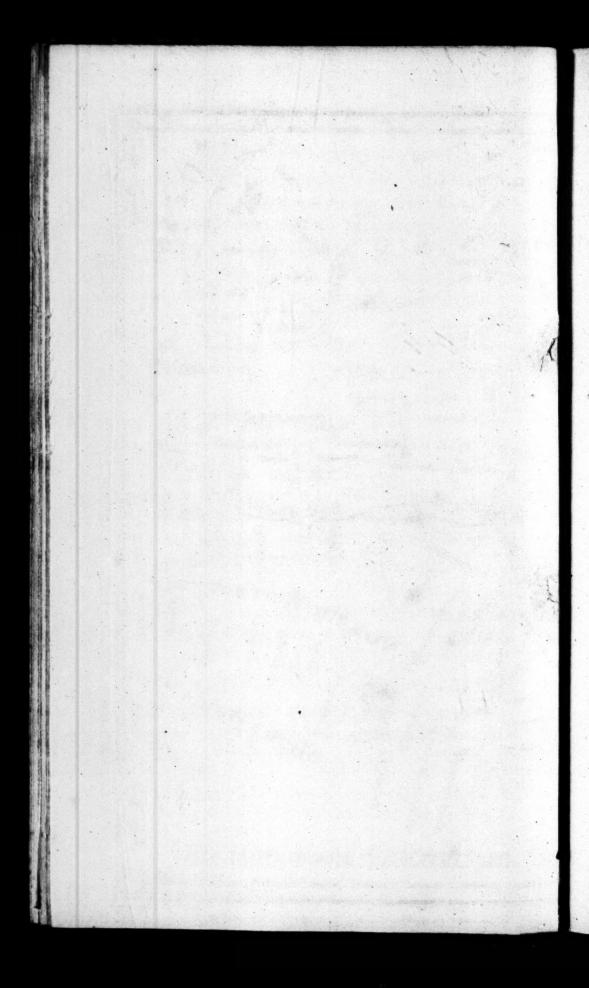
II. The EXTENT of its larger diameter about thirtyfive miles; its greatest width about twelve miles: including, in its area, and the cultivated lands which hang upon its banks, and which as property belongs to it, about three hundred square miles, or 200,000 acres.

of the Vale is extremely flat; nearly level; but being broken by hillocks, of different magnitudes, irregularly scattered,—and sometimes









marginal banks,—the eye can feldom judge either of its flatness or its extent.

These HILLOCKS and HEADLANDS are invariably fertile; mostly a fat clay: while the base on which they stand is either a rich sandy loam; the common soil of the west end of the Vale; or an inferior clay, interspersed with patches of moory soil; the prevailing soils of the marshes, and carrs, of the Eastern division.

The MARGINS are variously soiled. The skirts of the banks are mostly a rich middle loam; dry, yet cool (how eligible for the sites of villages!) but generally decrease in quality, with the rise of the hills which back them \*.

The face of the WOLD HILLS (which on this fide are bold but not broken) terminates, at the fummit, in a thin chalky loam;—the foil of Epsom and Banstead Downs.

The range of hills which rife at Malton, and fill up the space between the Wolds and the Heights of Hambledon; which at present are without a name; but which I shall term the

For the SUBSTRATA of the Vale, see the Section Soils, and their MANAGEMENT.

the Howardian Hills\*; are lower and less abrupt; terminating in a various soil; covering a well grounded, well wooded, fine sporting country;—the inserior hills of Kent.

The NORTHERN MARGIN rifes, in general, still less abruptly; terminating in a thin limestone loam, lying on a chain of heights, broken by wooded vallies, and backed by the moreland hills; which are intersected by cultivated "dales," appendages of the

" country" out of which they iffue.

IV. The CLIMATURE of the Vale is above the latitude it lies in (54°.). The fummer feasons are three weeks, at least, behind those of the southern provinces. What is remarkable, the seasons on the southern banks, about Malton, lying of course with a north aspect, are forwarder, by more than a week, than those of the northern margin, which lie sull to the sun. The substratum of both is the same; namely, Limestone Rock. The sact, perhaps, may be accounted for, by the pile of mountains which rise behind the northern banks; and which, though they discharge rivers of water, still retain at their bases

<sup>\*</sup> CASTLE HOWARD, the magnificent relidence of Howard, Earl of Carlisle, is feated among these hillocks.

bases a sufficient quantity, to keep their skirts cool through the summer season.

V. The RIVERS of the Vale are the DERWENT and the RYE; which, by receiving the waters of the Cofta, the Seven, the Dove, the Riccal, and other inferior brooks \*, is more copious than the Derwent, at their conflux. The rivers have their rise in the moreland mountains, are collected in the dales, and wind through the wooded vallies, into the area of the Vale; through which they move, with fluggard pace, to their narrow outlet. As a proof of the flatness of the Vale, the waters of the Rye are some four or five days, in passing from Hemsley to Malton (about fourteen miles): and those of the Derwent, not less than a week, in moving from Ayton (about fifteen miles) to the fame general outlet. It is highly probable, that, in a state of nature, a principal part of the Vale was subject to be overflowed. Even

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<sup>\*</sup> A rentarkable circumstance attends these brooks; all of which, from the Rye to the Costa (the Seven in a dry summer not excepted) fink (when at dead water) in the vallies between the Limestone Heights. Some of them rise again in the same vallies in which they fink: others disappear entirely. In the time of floods they all occupy the channels, which nature has provided for them, on the surface; and which, in the annexed Sketch, are marked by dotted lines.

now, fince rivers have been cut, and embankments made, extensive fields of water are fill to be seen, in times of sloods; not, however, through natural necessity, but for want of further exertions of art. By increasing embankments, and by removing obstructions natural and artificial \*, the rivers, in their highest swell, might be kept within due bounds.

VI. INLAND NAVIGATION. The Derwent is made navigable to Malton; and might, without extraordinary expence, be continued fo to Ayton; and the Rye and its branches might, with little exertion of art, be made navigable to Pickering, to near Kirkby, and to Hemsley. But a sequestered vale, without mines or manufactories +, and with two sea ports in its neighbourhood, and an inland port on its margin, requires the less affishance from internal water carriage. A removal of the present obstructions of the rivers is wanted, here, rather than more artificial ones.

\* The cataract-like mill dam across the Derwent, at Old Malton, is a public nuisance which reflects disgrace on every man of property in the Vale. It appears as if intended to finish what nature has left undone!

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+ Excepting a manufactory of coarse linen, which prevails, more or less, I believe, through the several districts of East Yorkshire. 1796. Since the first edition of this Work was published, two schemes have been suggested, and surveys made, by opposing interests, for bringing sea coals into the Vale, by means of inland navigation; the one from the port of Whitby, the other from that of Scarborough.

The latter is, by far, the most practicable. The base of the Vale is nearly level, from end to end, and the east end of it is not excessively elevated above the tide; and its distance, from Scarborough, as appears on the map, is inconsiderable.

This short ascent being surmounted, the only difficulty would be passed. A canal, of seventy or eighty miles in circuit, might be run round the Vale, without a lock! and without injury to the courses of the natural tivers.

The direction of such a canal would be nearly that of the dotted line of the map annexed (though not traced for this purpose). It would of course supply four market towns, and upwards of fifty villages, with water carriage: not only of suel, manures, farm produce, and timber; but of passengers,—on the Duke of Bridgwater's plan of stage boats: the cheapest and most easy mode of travelling.

From

From the west end of the Vale, a commusnication would not be difficult to make, with the canal, lately undertaken in the Vale of York; and thus open an inland communication, by water, between Scarborough, York, Hull, and the manufacturing district of West Yorkshire.

Should this Island continue to prosper, half a century longer, there can be little doubt of an improvement, so selfevidently great, being carried into effect.

VII. TOWNSHIPS. The feet of the marginal swells are studded with TOWNS and VILLAGES; which, in some parts, are not a mile afunder; but, in others, are farther distant, and less regular.

To these marginal TOWNSHIPS belong, generally, the lands of the Slope, with a portion of the area or bottom of the Vale; which, through this reason, is thinly inhabited. From the center, westward, a few villages are scattered; but from thence, eastward, the entire area, one township excepted, is included within the townships of the margin.

VIII. STATE OF INCLOSURE. A century ago, the marginal townships lay, perhaps, entirely open; and there are vestiges

tiges of common fields in the area of the Vale. The west marshes, church property, have been longer under inclosure: and the central townships were probably inclosed, long before those of the margin; the soils of that part being adapted to grass; and while the surrounding country lay open, grass land was of singular value. At present, the entire Vale may be said to be in a state of INCLOSURE; a subject which will be spoken of, fully, in its proper place.

IX. PRODUCE: wood, grass, and corn: the two latter at present intermixt, from the center of the area to the summit of the marginal heights.

X. The wood, though abundant, being confined principally to the vallies of the margins, does not afford general ORNAMENT; nor even appear to the eye at a distance. On a near view, however, some of those vallies contain great beauties. The situation of Rivaulx, the site of a dilapidated monastery, would satisfy the most craving eye. Were the extensive woodlands, which these vallies contain, scattered on the bosoms of the surrounding hills, the Vale of Pickering would be a passage of country, as singular in point of beauty, as it is in natural situation.

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# RURAL ECONOMY

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## LANDED ESTATES,

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### ESTATES AND TENURES.

I. THE LANDS of the Vale are much in the hands of small owners. The only large estate, which it contains, lies on its Western margin; and this, for magnitude and intireness, is exceeded by sew estates in the kingdom. The towns of Hemsley and Kirbymoorside, with the villages in their neigh-

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meighbourhoods, and an immense tract of Moreland, reaching to the verge of Cleveland, are included in the Duncombe estate. The Earl of Salisbury has a considerable property scattered across the richer part of the Vale, from Sinnington to Brawby: and there are some sew other off estates of Noblemen; in different parts of the District.

II. The Crown still retains, in right of the Dutchy of Lancaster, some property in the antient forest of Pickering; and the ARCHBISHOP OF YORK has a considerable estate in the marshes.

SIR WILLIAM ST. QUINTIN has a good property, about his residence at Scampston, and some other Gentlemen have residences and property in the Vale:

But the major part of the lands of the Diftrict are the property, and, in general, are in the occupation, of YEOMANRY; a circumstance this, which it would be difficult to equal in so large a District. The township of Pickering is a singular instance. It contains about three hundred freeholders, principally occupying their own small estates; many of which have fallen down, by lineal descent, from the original purchasers. No great man, nor scarcely a Country Gentleman,

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has yet been able to get a footing in the parish; or, if any one has, the custom of portioning younger sons and daughters, by a division of lands, has reduced to its original atoms the estate which may have been accumulated. At present, no man is owner of three hundred pounds, a year, landed estate, lying within the township; although its rental, were it rack-rented, would not be less than fix or seven thousand pounds.

IH. The prevailing TENURE is FREE-HOLD; which, however, is in many cases subjected to a small free-rent, reserved by the Crown, or the seudal lords of which it has been originally purchased. In Pickering, which is still held by the Crown as part of the Dutchy of Lancaster, the free-rent of the township is 281. 13s. which is received annually, by the freeholders in rotation, and paid, in part, into the hands of the lesses of the Crown; the remainder, I understand, to the heirs of the late Lord Feversham \*.

The COPYHOLD tenure is less prevalent, here, than in some other Districts: never-theless,

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<sup>\*</sup> Part of the township, it is said, having been given up in discharge of monies advanced the Crown by a citizen of London; who, in parcelling it out, has reserved a free-rent of 81. 2s. 6d.

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theless, it occurs in different parts of the Vale.

The West marshes are principally under BISHOPS LEASE for three lives.

An antient PRIVILEGE, founded in conveniency or a degree of necessity, and established in right by long custom, still remains evident in this District. This privilege, which is here termed a windrake, and which, probably, heretofore was granted, and may still be traceable, in different parts of the kingdom, gives the occupiers of one parish iberty to drive their cattle, to water, over the commons of another, which happen to lie between a meffuage, hamlet, or village, and a brook or other convenient watering place; with, however, a provision, that the cattle so watered shall not be suffered to "couch and ayer" on the ground driven over. But this original itipulation having in some cases been neglected to be complied with, the windrake ent, has, in time, grown into a right of common-vereless, been established, will be mentioned under the rticle Inclosures.

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#### GENERAL MANAGEMENT

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### ESTATES.

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#### PREFATORY REMARKS.

THE LEADING PRINCIPLES of management, here, differ widely from those which prevail in Norfolk \*. Here, tenants are in full possession of the farms they occupy; which, until of late years, they have been led, by indulgent treatment, to consider as hereditary possessions; descending from father to son, through successive generations; the insertion of their names in the rent-roll having been considered as a tenure, almost as permanent and safe, as that given by a more formal admission in a copyhold court.

One of the first estates in the District afforded, some years ago, a striking instance of this

<sup>\*</sup> See THE RURAL ECONOMY of NORFOLK.

this indulgent treatment. In the early days of its late possessor, the tenants were not only suffered to bequeath their farms, to their respective relations, but to fell the "good-will" of them, to strangers.

The effects of this, perhaps, unprecedented indulgence were these: the happiness of thousands of individuals;—a respectability of character of the source of so much benevolence; a retardation of improvements in husbandry; and, consequently, a loss of produce to the present community: this being one of the sew instances I have met with, in which a lowness of rent has operated as a cause of indolence in the renter.

In the later part of life, this benevolent character, perceiving perhaps the evil effect of too great indulgence, or actuated by other motives, increased his rent roll some 50 per cent. But still he preserved his respectability: for his farms were still moderately rented,

The present possessor has repeated the advance; but whether with equal propriety and equal credit, is a matter not necessary to be discussed in this place.

A fimilar conduct has been pursued, on another considerable estate in the Vale, and with similar effects. The first rise was mo-

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derate, and made with judgment; the last ill judged and immoderate; intailing years of wretchedness on numbers, who had hitherto partaken of the common comforts of life \*.

These, and other instances which have fallen within my knowledge, are fufficient evidences of the folly of deranging an estate, by excessive rents. Heretofore, the tenants on the estates above noticed, not only kept up existing erections, in proper repair, but renewed with fubitantial buildings; and made other improvements upon their respective farms, with the fpirit of owners; confidering them, in every respect, as their own estates; under a confidence that no advantage would be taken of fuch improvements; but that they would remain with themselves, and descend to their families.-Now, necessary repairs are neglected, buildings suffered to diminish, and improvements in husbandry laid aside; FOR ALL CONFIDENCE IS LOST: one rife has not been thought sufficient, and two may be thought too few. It is faid,

<sup>\* 1796.</sup> Fortunately for these tenants, though unfortunately for their Country, the rapid increase of paper money, and the consequent increase of the prices of farm produce, has saved them from that extreme of poverty, which threatened them, at the time the above passage was written.

and I am afraid with truth, that the common good management of laying down lands with grafs feeds has been dispensed with, "for fear "the field should look green, and the rent "of the farm be raised"!

Let this be as it may, it is abundantly evident, that both extremes, in the rate of rent, are prejudicial to an estate; and that in fixing a rental, as in all other human assairs, there is a HAPPY MEDIUM, which, though often dissicult to find, always deserves to be sedulously sought. No attention ought to be spared, in endeavouring to ascertain the FAIR MEDIUM VALUE of an estate to be raised; for on this, only, the advance can be adjusted with propriety.

It is evidently a want of policy, in the manager of an estate, to do any act which forseits the considence of TENANTS AT WILL. For, in this case, considence is the only tie between landlord and tenant; and if a rise of rent be necessary, it should be made with judgment and moderation, and at one advance; that the necessary considence may not be shaken, and the estate thereby rendered liable—to the waste of tenants at will, driven to despair.

With

With a Lessee, the case is different: the lease is, in this case, the tie: the maintenance of buildings, the usage of lands, and the term of occupation, are fixt; and the responsibility of the tenant may, in this case, apologize for an excessive rent, though it will not always be found a guard against its evil effects. However, it may be fairly inserted, that an estate can, with propriety, be rented higher under lease, than at will: and further, that Leases, or a firm reliance in the tenants, on the head and heart of their landlord, are, on every estate, absolutely necessary to improvements in husbandry.

It is not my intention to draw general inferences, unless they result aptly from facts under observation; and unless they tend to what appears to be an obvious improvement, in the general management of the District under survey. Nor is it my intention to distate, or even to recommend, unless when such improvements present themselves to my mind, in strong colours.

It appears, evidently, that, on the larger estates of this District, the tenants (entirely at will) have lost much of the confidence, which ought to subsist between landlord and tenant;

and it strikes me, clearly, that it would be good management, on such estates, to grant leases, on the larger farms, and fix the smaller ones at such rents, and under such assurances, as will restore spirit and peace of mind to their occupiers.

The management of a landed estate is not a light matter; the prosperity and happiness of the country it lies in, are nearly connected with it. And no other apology, I statter myself, will be required for publishing the foregoing sacts and resections; or for venturing to recommend an innovation, which prudent management might have rendered unnecessary.

The particular departments of management which require to be spoken to, under this head, are,

- 1. Manor Courts, 6. Covenants.
- 2. The Purchase of Lands. 7. Removals,
- 3. Tenancy. 8. Receiving.
- 4. Length of Term, 9. Heads of Leafe.
- 5. Rent. De rent beter coet vilegal ad bluos

I. MANOR COURTS. These antient sources of the law of villagers are still pretty generally kept open; even in manors where neither copyhold nor free-rent tenants remain; and where, of course, their legality is

disputable. Nevertheless, they have still their uses: the cleanfing of rivulets and common fewers, - the repair of roads to grounds, the fufficiency of ring fences,-and the eftimation of damages by impounded cattle,the stocking of commons, and the removal of public nuifances,-are matters which frequently require the interpolition of a jury; who, in places where they are still impanelled, are confidered, not only as judges of the general welfare of the manor, but are frequently called in, as arbiters of private differences: and who are fo fit to fettle village disputes, as a jury of neighbours, who have personal knowledge of the parties, and the fubject matter in dispute?

In a manor, where the lord has no interest in the well ordering of the lands and the inhabitants it contains, it might feem unreasonable to oblige him to maintain a court, at his own expence; but if fines for non-appearance, and amerciaments for defaults, could be legally recovered, the extra charge, if any, would be small, and might be borne by the county. And there appears to be no folid objection to a regulation, which would in the end be productive of public as well as private good: for whatever tends to the

advancement of cultivation and the well ordering of fociety, contributes to the virtue and prosperity of a Nation. . Wall and head

II. PURCHASE OF LANDS. From the multiplicity of small estates, in this Diftrict, frequent transfers of property take place; a market for land is always open, and the fair market price pretty accurately understood; confequently, the FLUCTUATING VALUE OF LAND may here be observed, with is effectively the fair market price, tegestravas

Some years ago, the price was extremely high; forty or fifty years purchase, upon a very high rent: lands not worth fifteen shillings an acre rent were fold for forty pounds purchase. This, however, was not uniform, through the District: for, at the time those extravagant prices were given, in one part of the Vale, lands, of twice the rental value to a . farmer, were fold, in other parts of it, at exactly the same rate; though the distance between them is only a few miles; and in the fame Diffrict, fimilar land is not, now, worth thirty pounds.

The cause of this disparity is a proper subject of investigation. The situation in one case is dry, with good roads; in the other low, and the roads deep and miry. That

is chiefly in the hands of finall owners—most of them monied men, and anxious to increase their possessions: this principally in the occupation of tenants. In that the rage of possession had broken loose, and ideal values had in consequence been fixed to the lands on sale; while the lands of this were out of fashion, and of course neglected. A moveable commodity may be carried to the best market; but land can only be sold at what is esteemed the fair market price, in the place it happens to lie in.

Hence it seems to follow, that a person who wishes to purchase, at a cheap market, without regard to locality, should look for a neglected District, and endeavour to avoid the neighbourhood of small owners, and that inordinate lust of possession, which is evidently epidemical, but not continual.

On the contrary, one who wants to fell should wait, if he can, until a dear time offer itself; or otherwise accept, perhaps to a disadvantage, the fashionable price of the day.

These inserences, however, are more strictly applicable to small than to large putchases.

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The present medial price of land, in this District, is about thirty years purchase, upon a fair rental value; but varies much with the circumstances it happens to be under

III. TENANCY. Upon most of the larger estates LEASES are unknown; the farms have been let AT WILL, and held as hereditary possessions, through successive generations. But it has been already observed, that the basis, on which this species of tenancy formerly rested, has of late years been sapped, and is no longer sufficiently secure, either for landlord or tenant.

In the marshes, in which the Archbishop of York has considerable property, LEASES FOR LIVES is the ordinary tenancy; and there, it is observable, rapid improvements in husbandry have been made. The farms are of a good size; and in the hands of men of property and spirit;—ranking, in every respect, with the superior class of yeomanry. See FARMS.

IV. LENGTH OF TERM. Lime being the factitious manure of the District; and upon old-inclosed land, the principal means of improvement; it may seem that a short term would be here sufficient. But if it be considered that the nature of much

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of the land, and the established practice and produce of the country, require an alternacy of corn and pasture, fourteen years is a reasonable term: if the price of labor and produce could be foreknown, twentyone years would, for the tenant, the estate, and the community, be more eligible.

V. RENT. Extremely high. In most parts of the Vale, much higher than even in Norfolk. There are lands under the ordinary course of husbandry let, to farmers, at thirty to forty shillings an acre. In many parts of the kingdom the same lands would not let for two thirds of the price.

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These circumstances imply a goodness of land, and a superiority of management,—or improvidence on the part of the renter. The three may be concerned. The land is good, and the management, in one particular, excellent; and it is allowed, that to this piece of management is principally owing the present high rate of rent.

Formerly, it was the universal practice to plow with four oxen and two horses, together with a plowman and one or two assistants. This extravagant plowteam is now universally reduced to two horses and a plowman. It is at least remarked, by men of observation

observation and judgment, that, without this saving in the mode of tillage, the present rents could not be borne.

It must be observed, however, that the lands, let at the above extravagant rents, lie in eligible situations; and are let in small parcels. The larger farms lie, in general, in less eligible situations; and there are few, if any, so high as twenty shillings an acre:

To speak of the medium rent of the District would be vague; the rate of rent is, or ought to be, proportioned to the quality of soils; and lands worth from a pound to a penny an acre may, probably, be found on the same farm.

This variation of soil enables the observant cultivator to make accurate distinctions, in the expence of management and produce; and, consequently, in the rental values of lands of different qualities: and this may account, in some measure, for the extraordinary estimation in which good land is held in the District.

This distinction is, in general, too little attended to, upon large estates; the number of acres being, generally, too much regarded, and the quality of the soil too little. Maps Vol. I.

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are convenient instruments in the hands of managers of estates; but unless they shew, with sufficient accuracy, the quality and situation, as well as the quantity of the land they represent, they become dangerous guides in fixing a rental: an accurate valuation is much more estimable than a hand-some map. The art of surveying may be learnt in a school; but the judgment requisite in the valuation of lands can only be obtained, by great experience in the field, and by some considerable share of knowledge of the particular kind of land to be valued.

VI. COVENANTS. Under the old tenancy, repairs were done, and new erections made, entirely by the tenants, landlord allowing timber; and, on some extraordinary occasions, a sum certain towards the workmanship and the other materials.

Gates and bedges were entirely under the management of the tenant; landlord allowing timber for the gates and dead fences, as well as for implements, used upon the farm; also hedging stuff and brushwood, for fuel.

The management of the land, too, was left to the tenant, who plowed and cropt it, in the fame manner as he would in all, probability have done, had it been his own estate.

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While the necessary confidence on the part of the tenants remained, these principles of management were abundantly fufficient. The tenants took care of the effate as their own: the landlord's only care being directed to the annual receipt of the rent. But finding the tenants alarmed, and some of them no doubt diffatisfied, with the recent additions of rent. it was thought prudent to introduce new regulations, respecting timber and the management of lands. Woodlands have been inclosed, and woodwards appointed. The plow has been restrained, and particular crops prohibited.

VII. REMOVALS. The TIME of the removal of tenants, here, is invariably Old Ladyday.

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By the custom of this country, tenants at will are allowed to clear the premises, previous to the day of removal, of bay, fraw, and manure! quitting the farm, on that day, and leaving it entirely naked of every thing. except the wheat on the ground; which, at harvest, he reaps and carries off! paying only for the "on-stand," or rent of the land which the wheat has occupied \*. THE RESIDENCE

Montheyer with Doz as he draw For-

<sup>\*</sup> Barley fown before Ladyday, on fallow, is also the tenant's, paying the incoming tenant for the on-stand only.

Fortunately, however, for all parties concerned, removals have, until very lately, been little practifed in the Vale: for a worfe time, or a worfe mode, could scarcely be devised. Old Ladyday is the middle of spring seed-time;—stock are still in the house;—the hay and straw partly eaten, and in part to eat;—and, at that time of the year, the roads, having been soaked and cut up, during winter, and stiffened by the winds of March, are in their very worst state. These are disadvantages to the outgoing tenant. The inconveniencies of an incoming tenant entering upon a farm, destitute of manure, and materials to raise it from, need not be enumerated.

In CLEVELAND, the time of removal is much more judicious. The incoming tenant takes possession of the arable land at Candlemas,—of the pasture grounds at Ladyday, and of the mowing grounds at Mayday;—when the outgoing tenant quits every thing but the wheat.

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These regulations are admirably adapted to REMOVALS IN SPRING, and render them more eligible, in many respects, than MI-CHAELMAS REMOVALS; even when tempered with the Norfolk regulations \*.

See Nort. Econ. Art. Form of LEASE.

Old Michaelmas throws wheat feedtime too backward, and the unthrashed corn incurs a long and frequently tedious connexion, between outgoing and incoming tenant: befides, the hay, the turneps, the feedage of leys broken up, and of young clover after harvest, make a long account between them: whereas, in Cleveland, the wheat on the ground, and perhaps a little remaining hay, are the only things to be valued (or removed), and the remaining wheat in the barn (if any) the only thing the outgoing tenant leaves behind him. If the barns be cleared by Mayday, which in general they may be without impropriety, the connexion between the outgoing and the incoming tenant (or landlord) diffolves, entirely, on the day of removal; which, namely Old Mayday, is an eligible season, and a leisure time of the

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The chief inconveniency, attending this mode of removal, is that of the incoming tenant (residing, perhaps, at a distance) putting in the spring crops. But there is no day in the year, on which this disagreeable business can be done, without inconveniency to all parties; and all that can be done is, to find out such days, and fix upon such regu-

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lations, as will reduce the inconveniency within the narrowest bounds possible.

From the observations I have hitherto made, New Michaelmas with the Norfolk regulations, and Old Mayday with those of Cleveland, appear to be the most eligible seasons of removal.

VIII. RECEIVING. The TIME of receiving varies on different estates. On one, Candlemas for the Michaelmas rents, and Midsummer for those of Ladyday, are the established times; and were they adhered to, better days, for the purpose, need not be chosen; though in strict propriety the first of March and the first of June might be still better \*. But to fuit the conveniencies or the caprice of the receiver, the ordinary times are feldom adhered to, the tenants being left in a state of uncertainty, as to the time of receipt; notices being fometimes given and countermanded, repeatedly: a state of embarrassment this, to the tenants, which implies unpardonable management. On a large estate, the days of audit should be as fixt and invariable, as the days of entrance and removal; and nothing but extraordihary circumstances can warrant a deviation. Upon

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<sup>\*</sup> See Nore. Econ. Min. 47.

Upon another estate, still more considerable than that above alluded to, the practice is to receive a few days after the rents become due; namely, about Ladyday and Michaelmas. Worse seasons would be difficult to fix upon,

With respect to the MODE of receiving, it is here reduced to the lowest degree of simplicity. The tenants not only repair and fence, but pay the land-tax of their respective farms, which they rent at a fum certain, fubject to no deduction; consequently, there are no accounts to be fettled, nor any voucher to be examined.

IX. FORMS OF LEASES. It has been observed, that the lease is a species of tenancy uncommon in this District; I know but of one estate on which it has been adopted; an off estate in the family of a Scotch nobleman. This estate is, I believe, principally under leafes of fourteen years.

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The form is not altogether excellent; but in some respects it is singular; and in others judicious. It exhibits the outline of management of that particular estate, and gives some idea of the Rural Economy of the District. There are clauses in it which many good tenants would object to; but there are others which are well adapted to the

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sell!

the preservation of the estate, without appearing to be oppressive or disgraceful to the tenant.

Leases are annually becoming more and more necessary; and it is my intention to adduce the forms of those of different Districts. The formation of a lease requires great circumspection. A collection of digested clauses will facilitate the task of drawing a new form, or improving an old one; and will at the same time produce, with the most substantial materials, a compendium of the general Management of Estates, in different parts of the kingdom.

LANDLORD AGREES to let;—certain specified premises;—from Ladyday;—for a rent agreed upon;—during sourteen years, "and thence from year to year so long as (both parties) shall please."

Also, to put the buildings in tenantable repair.

LANDLORD RESERVES all mines, quarries, and royalties; timbers, and timber-like trees, spires and other trees;—with power to search for, cut down, and carry away, at seasonable times; together with full power of sporting, &c. &c. (Tenant being allowed such damages

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as two indifferent persons " of equal degree" shall determine.)

Also a power to enter upon the premises, from time to time, to view the repairs, and the condition thereof.

TENANT-AGREES to take;—and to pay, without deduction (except the land tax) half-yearly; namely, at Michaelmas, and Lady-day (or within twenty days, demand being duly made), under forfeiture of the leafe.

Also, to pay such affessments, and to perform such services, duties, and customs, as are or shall be incumbent on the premises.

Also, to perform the customary leadings, or boundays, observed at the lord's principal mansion; Also "all other suits, services, "duties, and customs of any kind, which "now are or shall at any time, during this demise, be taxed, charged, or imposed!"

Also, to observe all rules, orders, and bylaws of the courts leet and baron of the lord.

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Also, not to let, nor suffer any person whomsoever to occupy, the whole or any part of the premises, "other than him "the said (tenant) his executors or admini"strators, their or his wife or children;—or
"a cow-gait to a cottager, holding under
"the

"the lord;" - without special licence in writing.

ALSO, to keep the buildings, fences, and watercourses in good repair; and to scour, yearly, such ditches and watercourses as landlord shall direct; provided the part so set out do not exceed one sixth of the whole,

Also, not to cut down, shred, top, or lop timber or other trees; but to defend, from cattle, all trees and hedges.

ALSO, not to burn fern, nor furze, for alhes for fale, without confent.

Also, not to fow rape, hemp, flax, woad, weld, madder, or hops; nor more than a specified quantity of potatoes, without leave.

Also, to hoe, properly, all lands fown with turnep feed, and "to dress and weed "them according to good husbandry,"—under the penalty of 10s. an acre.

Also, to spend on the premises all the grass, hay, and straw grown thereon.

Also, not to fell nor carry off dung, or other manure.

Also, not to stock the premises with

Also, not to suffer pigs to go loose without being rung. But in all things to use the premises in a husband-like manner.

ALSO,

ALSO, to refort with his corn, grain, and grift to his lord's mill.

Also, to employ fuch mole-catchers, and vermin-killers, as landlord shall appoint or approve.

Arso, not to obstruct workmen, nor gamekeepers, &c. &c.

Also, not to fport, nor keep fporting dogs, &c. &c. without leave in writing.

Also, in the last year, not to fow more than one fourth of the arable land with wheat.

ALSO, in the last year, to suffer the oncoming tenant to enter, after Michaelmas, to scale and dress the grass lands,—and to plow the arable for fallow, or for crops,—and to sow and harrow,—without hindrance.

Also, at the determination of the demife, "whether by furrender, forfeiture, or other"wife," to leave the last year's manure, straw, dung, and compost.

Also, to leave in tenantable repair, and without waste or spoil, all the houses, buildings, sences, ditches, and banks; AND to discharge all taxes, and other outgoings due from the premises.

TENANT BINDS HIMSELF, &c. in a spe-

cified fum for the due performance of the feveral covenants.

TENANT TO BE ALLOWED (by award of arbitrators) for the wheat of the last year:—
to be valued in August or September, before it be cut:—deducting, from the estimate value, the rent of the land it may grow on, agreeably to a specified valuation,

Also, for the turnep fallow of the last

ALSO, for the hay and straw lest unconfumed. AND for the manure of the last year; TOGETHER WITH the use of such land as landlord shall appoint, for the consumption of hay and straw, after the expiration of the tarm, until Mayday,

Also, during the term, to be allowed limestone for the use of the farm; such limestone being raised by the landlord, tenant paying sourpence, a waggon load, for raising them.

MUTUALLY AGREE that all unprovidedfor disputes shall be settled by arbitration.

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INCLOSURES.

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## INCLOSURES.

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THERE has, no doubt, been a time (and not perhaps many centuries past) when the entire country lay open; when common fields, common meadows, common pastures, open woods, and extensive forests and wastes, were the only division of lands, in this kingdom. Even the demesse lands of the feudal lords appear to have, once, lain open with the lands of their tenants.

FITZHERBERT, who wrote about two hundred and fifty years ago \*, speaking of the herbage

\* ANTHONY FITZHERBERT was Judge of the Court of Common Pleas, in the reign of Henry VIII. Beside his Natura Brevium, Justice of Peace, and other works in the law, he left two on Rural Economy—the Boke of Husbandry and the Boke of Surveying;—the first treatises, probably, which were written on the subject, in the English language; and the best that were written, for more than a century asterward. There has been some doubt about whether these two treatises were really written by Judge Fitzherbert; but I statter mysfelf I shall, in its proper place, be able to adduce sufficient evidence of their being his productions.

herbage of townships, says, "by that is to be " understood the common pasture of the et town whereupon the herdinan keepeth the " tenant's cattle; for it may be so good that " the tenants need not to have any feveral " pasture" simporting in this place stinted pasture]; "but that their common pasture " fhould be able to find all their cattle, both " horses, mares, beasts, and sheep! and so " it was of old time, that all the lands, mea-"dows, and pastures lay open and unclosed. "And then was their tenements much better " and cheaper than they be now; for the " most part of the lords have enclosed their "demesne lands and meadows, and keep "them in feveralty; so that their tenants " have no common with them therein." In this state the cultivated lands of the kingdom appear to have lain, in Fitzherbert's day. For in his last chapter, the subject of which is, "How to make a township that is worth " twenty marks a-year worth twenty pounds "a-year," he recommends inclosure; - not as a known improvement to be persevered in, but as a scheme eligible to be adopted.

In the present century, more especially within the last fifty years, inclosure has made a rapid progress; and its effects have in general,

general, I believe, been equal to those foreseen by Fitzherbert. The garden is the highest state of cultivation; open fields and common pastures the lowest; separate inclosures a middle state, which seems to be well adapted to the present population of this country.

Let this be as it may, the spirit of inclosure continues to be such, that, in half a century more, an open field, or an undivided common may be rare, and the remembrance of them will of course soon wear away. This is therefore the proper time to register interesting facts, relative to the subject, and this District the proper place for adducing them.

In my own remembrance, more than half the Vale under observation lay open: now, scarcely an open field, or an undivided common, remains. Besides, the largest parish in the Vale—one of the most extensive parishes in the kingdom—is now under inclosure; and the circumstances attending it are such, as have seldom occurred: a suitable opportunity, this, for endeavouring to ascertain just ideas of a subject, which, though it has of late years been much agitated, appears to be, even yet, impersectly understood.

In the beginning of the present century,

the immediate township of PICKERING re-

Having been thought too large to be laid out conveniently as one township, it had been judiciously split into two divisions, by a natural line, a considerable brook, which runs through it.

On each fide of the brook lay a fuite of COMMON FIELDS; three in humber; for the unvarying round of wheat, &c. beans, &c. fallow. These common fields were respectively divided into oxgangs, evenly scattered over every field; so that each occupier might have an equal or similar share of good and bad, near and distant land; the houses being in this, as in every other common-field township, placed in the town. Each field consisted of twenty two oxgangs; each of which, on one side of the township, contained twenty four acres—on the other, twelve acres: consequently the six fields contained 2376 acres.

Each division had likewise its common MEADOW.

Other portions of the township were laid out in STINTED PASTURES, wholly appendant to the common-field lands; each oxgang of which having a right to a limited number of gaits, for cows and working oxen.

The

The remainder of the township, containing many thousand acres, was common.

During this century, the common fields and common meadows have been gradually contracting, by amicable exchanges and transfers, and are, now, in a manner wholly inclosed. The stinted pastures have, at different times, been inclosed "by commission;" namely, by the unanimous reference of the parties concerned; to certain arbitrators or commissioners, appointed by themselves; without calling in the aid of parliament. The commons are now under inclosure, pursuant to a bill procured for that purpose.

This bill, and the circumstances attending the procurement of it, afford a striking picture of modern inclosures by act of parliament.

The lands to be appropriated, in this case, consisted of 3,700 acres of culturable soil, valued (by the commission under the inclusive) at 3s. to 50s. an acre rent; and of a still greater quantity of heathy barren land, reaching to the center of the morelands, valued (by the same) from below 3s. down to 3d. an acre. The quantity of oxgang or common-field land (as above ascertained) 2376 acres; and the number of ancient com-

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To those 2376 acres \*, and these 260 houses or sites, the commons belonged; but in what proportion had not, for ages perhaps, been clearly understood. Within memory, it seems, an attempt was made to stint them; but the regulation lasted only one year. Before and since that time, they have been, in the strictest sense of the word, unstinted commons, for all kinds of commonable stock; excepting sheep and working oxen; which last were, by the by-laws of the town-ship, confined to the stinted pastures, and the upland commons; and the former, to the upland commons only.

It may be taken for granted, that the first mover to an inclosure is private interest, rather than public spirit. In the case of Pickering, the LAND OWNERS, in general, were satisfied with the open state of the commons. Some of them who had inherited, ---or purchased at an advanced price, --- lands which lay conveniently to the commons, were, of course, adverse to an inclosure; and the mere house owners were either appreahensive of the smallness of their claim, or their

<sup>\*</sup> Together with the meadow lands.

their voices were too weak to be heard, among those of the land owners:

Under these circumstances, the commons lay open, and would probably have continued in that state, had there been no other interest in the township, than that of the owners of its LANDS and HOUSES:

But the tithe, of three or four thousand acres of corn land, was an object of too great magnitude to be overlooked, by the lesse (for lives under the Dean of York); and, being seen, had charms in it too fascinating to be lost fight of.

Actuated thus powerfully, the leffee of the tithes applied to the LAND OWNERS, to join him in an application to parliament, for an inclosure. The land owners refused. Their conduct, however, was impolitic and ill judged; and a fair opportunity lost is not tasily regained.

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The lessee of the tithes acted under a restless impulse; and no matter the instruments he made use of, so they answered his pursose. He, therefore, applied to the HOUSE DWNERS; who, seeing riches within their teach, which till then they had never thought of, grew frantic with expectation.

A law agent, well fuited to the defign,

was pitched upon; and other agents, no less qualified, gave him their best assistance. An equal division of the commons, among the houses only, was the prize held out; and a bill, framed for the purpose of obtaining it, was sent up to Parliament.

A faint ill conducted opposition was made, by the land owners; but a more powerful interest, well applied, having got there before them, their intentions of throwing out the bill were frustrated.

Parliament, however, seeing probably the iniquity of the bill, without being willing to enter into a minute investigation, or able, at their distance, to ascertain with conveniency sufficient facts, left a principal matter open to a trial at law; namely, whether the commons should be divided among the houses, only; or whether one moiety of them should remain with "the lands of the township, which, "upon the first of January 1784, belonged "to the owners of antient common-right messuages, cottages or sites."

In consequence of this order of Parliament, the question was tried, on a seigned issue, at the assize for the county, in the summer of 1785.

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The trial was conducted with the fame exertions, on the part of the promoters of the bill, and with the same tameness and ill judged confidence, on the part of its oppofers, as had been evident in every stage of the business. These circumstances co-operating with the "uncertainty of the law," a verdict was obtained, in favour of the houses.

Thus, by management,—without even the shadow of right being offered, - the owner of a mere cottage without a garden-place, or of a heap of stones which had long lain as ruins, and who could have no rightful advantage whatever from the commons in their open state, became entitled to an equal share, under the inclosure, with the largest landowner; who, perhaps, previous to the paffing of this law, occupied rightfully, fome hundred acres.

It is true, many poor families may gain a temporary relief by this inequitable transaction; and so far the bill may have operated beneficially. But it must be evident, to those who have a knowledge of the township, and who think impartially on the fubject, that they might, with equal propriety, have been relieved out of the inclosed lands, or the per-

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fonal property of the land owners; and it could not be the intention of Parliament, to be instrumental in transferring the property of one man to another, without a sufficient reason: we may therefore safely conclude, that Parliament, in this case, were either imposed upon, or judged erroneously; or that they are in want of some

## GENERAL PRINCIPLES OF INCLOSURE.

I shall not presume to dictate to Parliament; but as I have bestowed an unusual share of attention on this important subject, and may not have another opportunity, so suitable as the present, of speaking my sentiments upon it, I will here throw together the ideas which have struck me, as a groundwork for further argument.

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It will be proper, in the outset, to take a view of the ORIGIN OF COMMONS, and the first laying out of townships.

Fitzherbert, whose opinion in this case is valuable, speaking of customary tenants, in his 13th chapter of Surveying, says, "Customary tenants are those that hold their lands of their lord, by copy of court-roll, after the custom of the manor. And there is be many tenants within the same manor "that

" that have no copies, and yet hold by like " custom and service, at the will of the lord: " and in mine opinion, it began foon after " the Conquest. When William Conqueror " had conquered the realm, he rewarded all "those that came with him, in his viage " royal, according to their degree. And to "honourable men he gave lordships, ma-" nors, lands, and tenements, with all the in-" habitants, men and women, dwelling in the " fame, to do with them at their pleasure." And in his 40th chapter, in which he proposes to improve by inclosure, he says, "It " is undoubted, that to every township, that " standeth in tillage in the plain country, "there be arable lands to plow and fow, and "leys to tie or tedder horses and mares "upon, and common pasture to keep and " pasture cattle, beasts, and sheep upon; "and also meadow ground to get hay upon." In another part of the same treatise, chapter 4. "Of foreign pastures that be com-"mon," he fays, "This is a dark letter to "be understood without a better declara-"tion, for it may be understood three ways, "In many towns, where closes and pastures " lie in feveralty, there is commonly a com-" mon close taken in, out of the commons ee or

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"their oxen or kine, or other cattle, in which close every man is stinted, and set to a certainty how many beasts he shall have in the same, and of what manner of beasts they shall be.—Another manner of common is most commonly in plain champion countries, where the cattle go daily before the herdman, and lyeth near adjoining to the common fields; and it may lie in two or three places or more.—
"The third manner of common is the lord's outwoods, that lie common to his tenants, as common moors or heaths, the which were never arable land."

The same, or a similar distribution of lands

The same, or a similar distribution of lands remain, in every uninclosed township, to this day. Each township is one common farm; laid out into three arable divisions, for corn; a flat of meadow land, for bay;—and one or more pastures, for stock.

It appears evident from observation, in different Districts of the Kingdom, that, in laying out a township which contains a diversity of soil, the driest and best lands have been laid out as arable fields; the wettest, if sufficiently sound, as mowing ground; and the remainder as pasture land, and as a source of suel. fuel. In some townships, part of the pasture ground has been set apart as a stinted pasture, for some particular species of cattle; and, in others, part of the commonsield land has been laid to grass, for the purpose of teddering horses upon, in the corn years, and seeding sheep upon, in the fallow year.

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In townships of a more uniform soil, good land, fit for arable, has been set out as common pasture; for, in the days when townships were laid out, it would have been less possible to have cultivated and manured the common fields of a township, without a common pasture, than it would now be, when the uses of clover and vetches are known, to manage a farm entirely under the plow.

It is therefore evident, that common paftures and common fields are, in their original intention, and ever have been in their use, as inseparable as animal life and food:—it was pecessary to keep working stock, to till the fields, and almost as necessary to have other live stock, to consume the straw, and to raise manure. And it may be safely drawn, as an inference, that the berbage of the common pastures of a given township belong, in their original intention, to the arable and meadow

lands

lands of that township: for, without them, the former must have lain in perpetual fallow, and the hay of the latter have been useless. Consequently, by the original intention, every house which occupied a portion of the arable and meadow land of the township, had a right to a like portion of the berbage of the common pastures; and this without any regard to the time of its being erected; namely, whether before or after the laying out of the township.

But with respect to fuel, and the panage, (when these were not reserved to the lord) the original intention was undoubtedly different; for a certain plot of woodland (for instance) was set out, in proportion to the number of bouses in the township, at the time of setting it out. This was a grant of the lord, to the bouses in being, at the time of the grant; which particular houses thereby obtained an exclusive right to the suel and panage thus granted; otherwise an unlimited and excessive increase of houses might have abridged the original habitations in their right, and have done away the original intention.

Since the improvements in navigation, and in the art of mining, have taken place, many common woodlands have, probably, been cleared cleared away; for it is evident, from obfervation, confirmed by tradition, that many
of the grassland commons, which now remain,
and which, a few years since, were thickly scattered over the kingdom, were formerly covered wholly, or partially, with wood; the
original sources of suel and panage: which
fuel and panage belonged exclusively to the
original houses: consequently, when the land
which produced them was cleared, these
bouses had a plea for an exclusive right to the
berbage which succeeded.

Thus the ancient bouses having, by original right, a claim upon the wood, and, by implication, upon the berbage which succeeded it, they became objects of importance, compared with modern houses; and it appears to have grown gradually into a custom, which in time became law, that no modern house, nor even the lands of the township which lay to them, should enjoy either the fuel or the herbage of the commons.

And thus the antient houses, by implication, gained in part, and, by usurpation, entirely, a privilege of presenting the lands of the township, with the freedom of the commons: which privilege has rendered them more valuable, than modern houses, of equal size; and this

difference in value is the real interest they have in the commons.

It is the most they ever had, or can of right have, while the commons remain open. For a mere house, without land, has neither plow to work, manure to raise, nor fodder to consume, and cannot, in the ordinary course of husbandry, make any use whatever of the herbage of a common,

And with respect to the privilege of presentation, it is equally vague, in the owner of
an antient house, to lay claim to an equalized
share of the lands of a common, because
he has a power of enfranchising the lands
of others, as it would be in a lay-presenter of a living, to lay claim to the
benefice, because he has the advowson.
Whatever the advowson is worth, so much
interest the presenter of the herbage of a
common, or the profits of a living, has in that
common, or that living.

From these premises we may infer, that now, neither an antient house without lands, of a given township, belonging to it, nor a parcel of land without an antient house being held with it, is entitled to any share of the common herbage of that township. But, when-

whenever this house regains land, or the land is again laid to an antient house, the right of commonage returns. The right, therefore, only lies dormant; and is not, in either case, extinguished.

The same of a site. While covered with ruins, it can have no right either to suel or herbage; but whenever the house is rebuilt and inhabited, a right of suel returns; and having had lands laid to it, a right of herbage. And whatever a site is worth over and above the value of the land it contains, so much interest it has in the common lands of the township it lies in.

The interest of dormant lands may be ascertained, in a similar way: whatever their value is depreciated by the alienation from the commons, so much less interest they have in a division of them. To shut them out of an Inclosure Bill is to take them by surprize, and thrust them out of the township; thereby strangling that right which before had only slept; and which might the next year, or the next day, have awakened in its sullest lustre.

Beside these particular interests, there is one general interest to be considered; namely, the situation of lands, houses, and sites, with respect to the common to be inclosed;—for

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bouses; at least; which are situated contiguous to a common, had, in the first instance; have had, ever since; and must have, while the commons remain open, a greater benefit from its herbage, and have on that account been sold and purchased at a greater price; than houses situated at a distance; and, of course, have a right to a greater share of the lands to be inclosed:

The interests of sites vary in a similar manner.

But, with respect to lands, this species of interest is less evident. While common fields and common meadows lie open, they have little advantage or disadvantage from situation, with respect to the common pasture. But where the arable and meadow lands have been inclosed, and the pastures remain open, fituation becomes of confiderable importance. And where the appropriated lands have been long held in severalty, and have been fold and purchased under those circumstances, the lands which lie near to the common pastures feem to have gained, by the circumstance of inclosure, ratified by long usage, an extraordinary and permanent interest in the herbage: an interest which they can never lose, so long as the appropriated lands remain inclosed, and

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the common pastures remain open. Hence, it is unwise in those, whose lands lie at a distance from the common pasture, to suffer a partial inclosure to take place; for by that means they are establishing, to their own disadvantage, a species of interest in common pastures, which before had no existence.

Before we proceed farther, it may be proper to confider the limits of commonright, on unstinted common pastures.

It is generally understood, and may, I believe, be confidered as the common law of the realm, that each commonright house has a power to fummer as much stock on the common, as the lands which lie to it will winter: or, to speak more practically, a right to stock in proportion to the value of the lands, respectively held with the commonright houses: for it fo happens, that by improvements in husbandry, fince the time of laying out townships, -more especially where the appropriated lands have been inclosed,-commons in general are unable to support, in summet, so much stock as the arable and meadow land can, in winter; consequently, it is become impracticable to adhere, strictly, to the antient regulation: which antient regulation, however, though time has rendered it in most cases impracticable, is as strong an evidence, as is necessary to be produced, in savor of the herbage of unstinted commons belonging solely to the land.

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That the idea is antient, and not of modern invention, may be feen in Fitzherbert; who, in his 6th chapter, "Of Foreign Woods, " where other men have common, but where "the lord may improve himself;" fays; "It is clearly ordained by the statute of " Merton, and after confirmed by the sta-" tute of Westminster, that the lord shall "improve himfelf of his wastes-leaving his "tenants sufficient common. It is necessary to " be known what is fufficient common; and that " to me seemeth by reason should be thus: "To fee how much cattle the hay and the " straw, a husband getteth upon his own te-" nement, will find sufficiently in winter, if " they lie in the house and be kept therewith " all the winter feafon; for fo much eattle " should he have common in furnmer; and "that is sufficient common. It consequently follows, that the occupier of a house without land could not, of right, keep cattle upon the common in summer; because his tenement afforded afforded him neither hey nor firsw, wherewith to keep them in the house, during the winter featon want to reaccilling the winter

Lastly, the interest of the lord of the foil requires confideration! Here, Fitzherbert's treatife may be taken as a fafe guide. The groundwork, of the first seventeen chapters, is a statute of Edward I: named Extente Manerii i of which Fitzherbert himfelf gives the following account: " In mine opinion, this "Ratute was made foon after the Barons' " wars, the which ended at the battle of "Evelham, or foon after, in the time of " king Henry III. whereat many Noblemen " were flain, and many fled, who after were " attainted for the treason they did to the "king. And by reason thereof their castles "and manors were feized into the king's "hands. And so for want of reparation the " castles and manors fell to ruin and in decay. " And when the King and his Council faw that, " they thought it was better to extend them. " and make the most profit that they could of "them, than let them fall to the ground and "come to no man'shelp and profit; therefore, "King Edward I. ordained this statute to be " made the fourth year of his reign, wherein " is contained many and divers chapters and Vol. I. " articles.

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"articles, the which, at that time, were but "instructions how and what they should do "that were Commissioners or Surveyors in the same," out to florate out, with

plained by an able Judge, afford evidence of the highest authority. It said to show have

A clause of the statute, respecting common pastures, runs thus: "It is to be enquired of "foreign pastures that be common how many and what sort of cattle the lord may have in the same, and what the pasture of a beast is worth by the year."

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"a dark letter to be understood without a bet"ter declaration;" because there are three
sorts of commons: namely, a stinted common
close;—a tended common, open to the common field;—and the lord's outwoods, or unstinted common pasture. In the two former,
he says, "the lord should be put to a cer"tainty—and every man be stinted either by
"yard-lands, oxgangs, rents, or such other
"custom as the tenants use,—and the lord in
"like manner."—But in the outwoods; "me
"seemeth the lord should not be stinted nor set
to a certainty, but put his cattle upon such
"manner of common pasture at his pleasure;

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" because the whole common is his own, and " his tenants have no certain parcel thereof " laid to their holdings; but all only bite of " mouth with their cattle?" by which is evidently meant (from various passages) sufficient bite for the tenants' cattle. Hence, it clearly follows, that if the herbage of the common be more than fufficient for the cattle of the township, the overplus, be it more or less, belongs to the lord. On the contrary, if the herbage of the common is not more than fufficient to fummer the cattle, which the township can maintain in winter (in an uninclosed state), the lord has not (merely as such) any interest whatever, in the berbage of the commore within his manor, and not mereplace,

In another clause, respecting outwoods specially, the statute orders, that it is be en-" quired of foreign woods, where other men " have come-in, what part of those woods the " lord may improve himself of, and of how " many acres, and for how much the vefture, " that is to fay, the wood of every acre may " be fold, and how much the ground is worth " after the wood be fallen, and how many " acres it contains, and what every acre is " worth by the year." a vall of in goo ron

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By this clause, it is implied by Parliament, F 2 that

that the wood of a common belongs folely to the lord: and Fitzherbert's exposition of it implies the fame idea: "The doclaration of "this statute is doubtful; because of the " non-certainty of what is fufficient common;" which having explained as above; he continues, " You shall understand that there be " four manner of commons, that is to wit;-"common appendant, -- common appurte-" nant,-common in groß, and common " because of neighbourship. Common ap-" pendant is wherethe lord of old time hath " granted to a man a meseplace and certain " lands, meadows, and pastures, with their " appurtenances, to hold of him. To this " meseplace, lands, and meadows, belongeth " common, and that is common appendant. " -Common appartenant is where a man " hath had common to a certain number of beafts, or without number, belonging to " his meleplace in the lord's wafter this is s common appurtenant by prescription, be-" cause of the use out of time of mind. "Common in groß is where a lord hath " granted, by his deed, common of pasture " to a ftranger that holdeth no land of him, " nor ought to have any common but by " reason of that grant by deed .- Common es of

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" of vicinity or neighbourship is where the "waste grounds of two townships lie toge"ther, and neither hedge nor pale between 
"to keep their cattle asunder: this is com"mon because of neighbourship; and it is 
not used nor lawful to pin the cattle so 
going; but in good manner to drive and 
chace beside such common."

Of common in gross, he says, "the lord may not improve himself of any parcel; for it is contrary to grant, though there be sufficient of common." But "ye shall understand that how be it a lord may not improve himself of his waste grounds, yet may he lawfully fall and sell all the wood, broom, gorse, surze, braken, fern, bushes, thorns, and such other, as free-stone, limeftone, chalk, turves, clay, sand, lead-ore, or tin, to his own use; for the tenant may have nothing by reason of common, but only bite of mouth with his cattle,"

Hence, we may conclude, that the cutting of fuel (if practifed) was, then, merely on fufferance.

In his explanation of a clause respecting panage, &c. he says, "Where this statute "speaketh de panagio, that is to be understood "where there is any mast growing in the F 3 "lord's

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"fed and relieved; what profit that may be to the lord; for there is no man that can claim of right to have the mast, the which is a fruit, but the lord; and the lord shall have it in foreign or outwoods, as well as in his parks or several woods; and as the quantity of mast is, so the lord's bailey ought of right to lay men's swine thereunto from Michaelmas to Martinmas, and to make a true account thereof at the lord's audit, what he taketh for every swine."

Thus it appears, that not only fuel, but panage, likewise, was originally a matter of sufferance, when enjoyed by the tenants.

From these premises, and from the present insufficiency of commons, we may safely
infer that the lord (merely as such) has no
interest whatever in the berbage of commons
within his manor. But we may infer, with
equal safety, that of the wood of a common
the lord is sole proprietor; except where a
right of such and panage has been established
by long custom; for, in this case, prescription has frustrated the original intention;
and, here, the bouses have a joint interest with
the lord,

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Lastly, with respect to beaths and peatmoors, from which the inhabitants of a township have, by prescription, a right of cutting fuel:

The statute orders, that it be enquired of moors, heaths, and wastes, what they be worth by the year;—and Fitzherbert says, "Moors, heaths, and wastes, go in like manifer as the herbage of the town; for the "lord's tenants have common in all such "out grounds with their cattle; but they "shall have no wood, thorns, turves, gorse, "fern, and such other, but by custom, or else "special words in the charter."

We may therefore conclude, that the lord has no interest in the herhage of a heath; nor in the fuel; except there be more than sufficient for the use of the inhabitants of the ancient houses; in which case the lord seems to have an interest in the overplus; provided he can reap the benefit of it, without injuring the berbage.

From the sum of this evidence it appears, that, at this day, lords of manors, in general, have no other interest in the commons, within their respective manors, than in the mines, the quarries, and the wood. The berbage be-

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longs to the land; and the fuel (where cuf-

As to the right of foil, it appears to be merely bonorary: for the foil cannot be removed, nor turned to advantage, without deftroying or injuring the berbage. A lord of a manor has, however, a claim upon the foil, though indirect: for no man, nor fet of men, can break it without his confent. But this feems to be a claim of bonor rather than of interest; for, while the commons remain open, he cannot, in strict legality, reap any emolument from it.

Thus we have enumerated five diffinct in-

COMMONRIGHT LANDS HELD WITH COMMONRIGHT HOUSES. To these lands

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By COMMONRIGHT land is meant the original common field and common meadow land, and such other land, lying within the township, as has, by grant or prescription, a right of commonage when held with a commonright house; in contradistinction to such lands of the township as have not, and to the lands of the rest of the kingdom which never can have, by any legal act, such a right, though held with a commonright house. Suppose nine tenths of the township in a state of temporary alienation, by some legal circumstance which could not be avoided, or by any circumstance whatever, could the other tenth part catch the opportunity

the benefit of the berbage belongs, in proportion to their value; and the right of the respective parcels, to share in a division of the lands, ought to be ascertained by their intrinsic quality, and their affinity to the common (where this operates on their value in the open state) taken jointly \*.

out common right Houses. The original right of these lands was indisputably the same

tunity in the interval of suspence, and appropriate the lands of the commons to this one tenth of the township? It would be absurd to suppose it. If one tenth cannot by any advantage chouse the other nine, why should nine parts of a township be suffered to share the right of the tenth? See P. 52.

To fet aside the lands of the township entirely (as in the case of Pickering) is too absurd to be treated of seriously. Suppose nine acres of ten, or ninety-nine of one hundred, of a given township, to belong to one house, and the other one-hundredth part to be divided among two hundred and siftynine houses: or suppose the commons of a given township to contain many thousand acres, and the appropriated commonright lands to consist of 2376 acres; that the commonright houses of the township were only two, and that 2370 acres of the appropriated lands belonged to one house, the other six acres to the other house; would it be equitable in either case to divide by the houses? If not in these cases, why in any case where the principle of right is precisely the same?

fame as that of the other lands of the townfhip; and their temporary alienation is merely
a circumstance, which does not extinguish,
but only suspends, their right to a benefit of
the berbage. Whatever this temporary alienation depreciates them, below the other
lands of the township of the same intrinsic
quality, in similar situations, so much proportionably less is their right to a share of
the lands of the common \*.

3. COMMONRIGHT HOUSES. The proportional rights of houses depends on the nature of the commons to be inclosed.

If they produce berbage alone,—a commonright house ought to share with the lands, in proportion to its extra value as such; that is to say, whatever it is worth more than a non-commonright house of the same intrinsic value, in a similar situation, so much it ought to be estimated at, in the general valuation

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\* The depreciation here intimated will feldom take place; for the appropriated lands of a township are worth more to the occupier of a common right house; because they intitle him to a greater share of the common pasturage, than to the occupier of a non-common right house, to whom they can seldom give any adequate privilege.

luation of the commonable property of the township \*-

If the common to be inclosed produce fuel alone, the houses (or the houses and the lord of the soil, if an overplus can be proved) are alone intitled to it.

If herbage and fuel jointly, the lands and houses have rights in it, proportioned to the herbage and the fuel it produces +.

4. COMMONRIGHT SITES. The right of fites is similar with that of houses: whatever the dormant right of presentation and the dormant right of fuel are worth, so much in proportion they ought to share with the lands and houses.

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\* The extra value of commonlight houses varies with the value of the commons and the number of houses. Thus, suppose the commons of two distinct townships to be of equal value, and that one township contained ten, the other one hundred commonlight houses; the right of presentation would be worth more in that than in this township; and where herbage alone is the produce of the common, the right of representation and the extra value are the same.

+ If part of the commons to be inclosed produce herbage alone, and other parts principally fuel, and a feparate division be made (as in the case of Pickering), the extra value is compounded of the right of presentation to the herbage, and the right of cutting suel; either of which being estimated, the other is of course sufficiently ascertained, of a common, on which open woodlands still prevail, the lord of the soil has a principal right. But whatever the bite of mouth is worth, so much in proportion the land is entitled to; and if a right of fuel be established by custom, the bouses have their claim. Whatever proportional advantage the several interests would receive, in an open state, such proportions of the land they are severally intitled to, under an inclosure.

If valuable mines and quarries be given up, the lord ought to receive an equivalent, in land, and is entitled to some share, for the mere chance of mines, and quarries, being hereaster discovered. But of naked commons, affording neither wood nor suel, and of which the mines and quarries are reserved, the lard of the manor (merely as such) has not, on the principles offered, any right to share in a division of the soil, saving the honorary right which has been already mentioned\*.

ship the right of repredictation and the evera ve avere

<sup>\*</sup> In the case of Pickering, the Crown, as owner of the honor, forests, and manor of Pickering" (in right of the dutchy of Lancaster), had one tenth of the principal part of the township, and one fifteenth of the remaining part, granted by the act of Inclosure.

me, I will make a few further remarks.

them, only, being directed to value the common lands, and to set out the king's allotments. Of these three, one was nominated by the chancellor of the dutchy of Lancaster; one by the lessee of the tithes (who could have no special right of nomination, as no part of the commons was ordered by the act to be set out as tithes); and the third by the proprietors of the township. Before the lands were valued, and the allotments set out, the commissioner of the tithe-lessee obtained an appointment under the Crown; in

The woodlands, in this case, had formerly been inclosed and held by the Crown in severalty; and the remainder of the commons given up entirely to the appropriated lands of the township; shutting out even the park, and some demessee land of the dutchy, from a right of commonage; so that neither wood nor woodland is by the act given up; yet all the manerial rights are reserved; except the bonorary right of soil, and except quarries of stone and state; which last are sufficiently abundant in the old appropriated lands to supply the township with building materials and lime manure for at least a thousand years. Therefore, the consideration given up was of inconsiderable value—compared with that which was given as equivalent; but which appears to be, in this particular case, unreasonable and excessive.

confequence of which the township was in effect valued, and the Crown allotments set out, by the agents of the Crown, without the proprietors of the township having, in any case, a casting vote; their commissioner becoming, under these circumstances, a mere by-stander.

It would be well if, in cases of importance, bonorary commissioners, chosen out of the independent gentlemen of the neighbourhood, could be appointed; as a check upon acting commissioners, in predicaments of this nature.

2. New roads to be made, and old ones to be repaired; — common drains to be opened, and public refervoirs formed, by the commissioners, at the joint expence of the lands to be inclosed.

The forming of reservoirs of the waters collected by the roads, for the purpose of public drinking pools, ought to be a standing clause in every Inclosure bill; and commissioners, most especially in upland situations away from running waters, ought to pay due attention to it.

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3. Lands, exceeding the yearly value of three shillings an acre, to be divided and inclosed,—the residue to be allotted, only; leaving

teaving it in the option of the perform to whom they be allotted, to inclose them, of let them remain in a state of open common; subject to such regulations as the commissioners shall appoint.

Too much cannot be faid in praise of this distinction. Good land will always pay for inclosing, and be the most valuable in that state; but bad land is frequently too dear at that price? many men of comfortable fortunes have, in this District, been beggared, and the fortunes of others injured, by the inclosing of lands which have not yet paid, nor probably ever will repay, the expence; and the same may be observed, in other Districts of the kingdom.

4. A good regulation respecting fences is likewise noticeable. The act allows a privilege of placing a sence, on the outside of the ditch, upon the adjoining allotment, to dessend the face of the young hedge; and to remake and remove such sence during and within the space of ten years. Also to continue the sence at the ends (by rails reaching over the cross ditches (to the posts of rails of the adjoining cross sences.

5. Lastly, the reference of matters in dif-

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pute to a trial at law requires the most ma-

The appropriation of commonable lands is an important matter: they are useful, in an open state; but would, in general, be much more useful, in a state of Inclosure. Whoever has reaped a rightful benefit from them, time immemorial, ought to have that benefit continued to them: and all that Parliament has to do is, to ascertain the quantity of right, of each party or interest concerned, in the particular hill before them;—or to refer special matters, in dispute, to some other inquest, more peculiarly adapted to the necessary enquiries;—or to refuse the application.

A court of affize is, perhaps, the most improper inquest, which could be referred to, for settling disputes respecting Inclosures: and are, certainly, much less adapted to make the necessary enquiries, than a committee of the House of Commons; where every Member is a judge, and has sufficient time for deliberation; whereas, in a court of assize, all is hurry and tumult; with only one man to think, and the mind of this one man necessarily crowded, with a chaos of ideas.

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It will however be said, that a special jury, of the county in which the site of Inclosure lies, are the sitest to determine the rights of the claimants. This, in theory, is plausible; but is seldom verified in practice.

In the case of Pickering, only sour of the special jury attended; and one of these was a tradesman of the city of York. It is highly probable, that not one of the jury resided within twenty miles of the site of Inclosure; or had the smallest share of personal knowledge, either of the site, or the subject of Inclosure. A jury impanelled, in any other county of the kingdom, might have been equally qualified for the purpose.

It was therefore a mere trial at low, which, to a proverb, is a game at hazard. The houses were, once, within a point of losing the game: Sir Thomas Davenport died, and Mr. B. (their two leading counsel) was put under arrest, the day before the trial was to have come on; and their agents, sanguine as they had heretofore been, now, on those accidents happening, gave themselves up to despair. But, by chance, or by management, the trial was postponed. The houses, now, came into court, fully prepared, while the land, by a train of ill luck or had management,

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was, in effect, left without an advocate; and, folely by "the uncertainty of the law," loft its right. Even the house owners, themselves, considered the verdict as a game artfully won—and their large allotments, as plunder bravely got. Right was out of the question: the idea of it had been absorbed, long before the decision, in rancour and ill blood; a circumstance more to be lamented, than the inequitable division of the commons.

In the case of KNARESBOROUGH, too, a dispute, between the land owners and house owners, was ordered to be decided by legal contest. There, as at Pickering, the houses \* claimed the whole; but the lands bappening, in that case, to employ the better forces, they gained the day. Almost the whole forest was divided among the land owners: even a messuage

In this case the houses were divided into messuages and cottages—one messuage was considered as equal to two cottages. This distinction, which is not uncommon, has most probably arisen from the circumstance of the woodlands being grubbed for the sake of herbage. A messuage, namely, a house with which land was anciently occupied, had not only a privilege of cutting fuel in the outwoods, but, of necessity in early days, a privilege of taking plowboot, carsboot, &c. Hence, its claim upon the berbage which succeeded the wood became greater than that of a mere cottage, with which no lands being occupied, had no use for implements of husbandry.

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messuage did not share, on the best land, more than two acres. The land owners had offered the house owners a greater proportion; but they chose to take their chance in a court, as other desperadoes take their chance in a lottery—a landed estate, or nothing; and, it is said, what some of them got did not pay their extra expences. Here, the poor man lost his right: a circumstance which renders the case of Knaresborough barder than that of Pickering.

These are facts which appear to be sufficiently striking, to induce Parliament to establish some GENERAL PRINCIPLES OF INCLOSURE, and to enquire, themselves, into the rights of claimants: or, if a committee of Parliament cannot conveniently determine, to order reference to a commission of independent difinterested men, in the immediate neighbourhood of the fite of Inclosure; who, having personal knowledge of the premises, and the claiming parties, are best enabled to judge of their respective rights: or, if the opposition in Parliament be strong, and the matters in dispute too weighty to be left to reference, to fend back the petitioners, and let the commons remain open. It does not

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follow, that because a few individuals, instigated, perhaps, by one more interested than the rest, take it into their heads to try their fortune in a Bill of Inclosure, that a suite of valuable commons should of necessity be inclosed. A few years might reconcile differences in opinion; and, then, there might be no difficulty in assigning every man his rightful share.

The fate of SINNINGTON was determined by that of Pickering; the different interests having agreed, previously to the trial, to abide by the decision of the court.

The Sinnington bill is entitled to a few

remarks:

1. Tithe. It is difficult to write with temper on the subject of tithes. At the time they were instituted, specie was little in use, as a medium, between the producer and the consumer of the productions of the soil; and then it might be necessary, that the clergy should be supported out of its immediate produce. But to continue this ancient regulation, in a time when money is become the universal medium of property, and when improvements in cultivation engage the attention of all ranks of mankind, is an impropriety,

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propriety, which none but the abettors of oppression will defend.

A general dissolution of tithes, though fervently to be desired, is not probably yet near at hand: the bugbear innovation is, at present, too terrible in the eyes of the Many: but, under the circumstances of the present times, to increase the quantity of titheable lands, as in the case of appropriating commons without assigning some certain part of them, or some other equivalent, in lieu of tithes, is a crime which posterity will never forgive.

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In the case of Sinnington, every thing is done which, under the false principles of the bill, could be done: indeed more; for even the general principle of the bill was broken into, with respect to the tithes. The act assigns one tenth of the commons for the tithe of the commons; and, afterwards, empowers the commissioners to set out a surther parcel of them, for balf the tithes of the old-inclosed lands of the township, belonging to the common ight houses: which is, in effect, giving so much of the commons to the common sight lands, independent of the bouses. And surther authorises the commissioners to award a perpetual modus or

money-payment, in lieu of the other balf of the commonright lands; and for the whole of the dormant lands; namely, such lands as had not, some time previous to the passing of the bill, a commonright house belonging to them\*. Thus the entire township is freed, for ever, from a species of oppression, which the whole kingdom is entitled to be relieved from.

2. Lord of the foil. The Sinnington Bill assigns one five-and-twentieth for the right of foil only; all other manerial rights whatever being reserved. No quarries, or known beds of marl, &c. on these commons.

3. Denizen right. The priory of Keldholm, which anciently stood at a short distance from these commons, without the boundaries of the township of Sinnington, had a right or freedom of commonage, for fixty beasts, and four hundred sheep. This right has, of late years, and perhaps ever since the

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The false ground of this distinction has been already shewn. Suppose a transfer of a principal part of these lands to have taken place (through ordinary circumstances, without any simister views to an Inclosure) about the time the exclusion of right takes place,—would the mere circumstance of fixing the particular day of exclusion twenty-four hours before or twenty-four hours after the day of transfer, alter, either one way or the other, the natural right of such lands to share in the benefits of the Inclosure

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the dissolution of the priory, been exercised in part, but never perhaps wholly. The Earl of Scarborough, who is at present in possession of this right, has received little more than a yearly acknowledgment: nevertheless, on a division of the commons, his claim became important; for the ancient right, in its fullest extent, was equal, perhaps, to half the pasturage of the commons under inclosure.

In this case, the dictates of common prudence would have led the promoters of the bill to have fixed the quantity of right, before they went to Parliament. This, however, was neglected, and all the act empowers the commissioners to do, in this respect, is, to examine into the merits of the claim, and fet out fuch a part of the commons, as appears to them to be a compenfation. The consequence is, an injunction has been granted to stop proceedings: through which circumstance the inclosure is at a stand, to the great inconveniency of the township. A certain and considerable expence is incurred-commonable flock fold off-and fencing materials prepared-without, at present, any certain advantage accruing; a predicament this, which ought to caution the promoters of Bills of Inclo-

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fure, to have a clear understanding with the feveral interests concerned, before they burden the township with the expences of a bill, and the consequent inconveniencies.

4. Alien claim. Another claim is made upon these commons—by the owner of a farm which lies by the fide of them, and whose stock has, time immemorial, been suffered to depasture upon them. It is supposed that this encroachment has been made thro' the means of a windrake \* across a corner of these commons, to a river which runs at a distance; or that it has been suffered to take place, through mere neglect: let this be as it may, it ought to be a leffon to uninclosed townships, to attend to the flock of their respective commons. I term it an incroachment, because there is not a more general polition, than that the commons of a given township belong, in original right, to the lands and houses of that townthip, and that no right of commonage can be justly claimed, by the lands and houses of another township, unless a special grant, or fomething adequate to it, can be produced. Custom may, in this case, be confidered, in law, as adequate to a grant; although,

<sup>.</sup> See ESTATES AND TENURES.

although, in equity and common fense, itmight seem more reasonable to award damages, for a trespass, than a portion of the commons, as a compensation.

5. Fencing. The whole to be inclosed, within fix months from the time of staking out. Counter fences may be made upon the adjoining allotment, and over the terminating cross ditches \*. Sheep to be kept out of the new inclosures, during the first seven years; and all kinds of stock out of the lanes, during ten years;—after which time, the surveyors of the roads of the township may let the grass of the lanes and byeways, and apply the rents to the repair of the roads:—an admirable clause!

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6. Appeal. By this bill, persons aggrieved may appeal to the Quarter-Sessions; except in such cases where the determinations of the commissioners are directed to be final. This, in some cases, may be a check upon the acting commissioners; but is far from being equivalent to a special commission of gentlemen, resident in the neighbourhood, who would, in all cases, be on the spot, to be appealed to. To do strict justice to every individual, in a complicated business, of this na-

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ture, is beyond the power of abilities and honesty to accomplish; but the nearer this summit can be approached, the better; and every probable means should be employed in attempting it.

In the case of MIDDLETON, balf the commons were assigned to the Houses, balf to the LAND, in proportion to the land tax: a mode of division which has, I believe, been pretty generally adopted in the Vale.

This method of apportioning the shares of the land owners is, in townships where the land tax is levied by rack rents, more equitable, than it is in cases where it is paid by ancient valuation, as it was in Middleton when the Inclosure took place: but it cannot, in either case, be strictly equitable; nor approach so near to strict equity, as a valuation according to circumstances, at the time of inclosure.

On this, alone, an equitable division of commonable lands can be made: not with respect to land, only; but with regard to every other species of commonable property. Whatever benefit the several interests, and the individuals of the respective interests, rightfully enjoyed, previously to the inclo-

SURE, OR WERE, in reversion, RIGHTFULLY ENTITLED TO, (AS DORMANT LANDS AND HOUSES), SUCH PROPORTIONAL BENEFIT THEY ARE SEVERALLY ENTITLED TO, UNDER AN EQUITABLE APPROPRIATION.

BEFORE I take leave of this subject, I will note the effects of the three different means of Inclosure, which have been, in different townships, made use of, in this District: namely,

- 1. Inclosure by Exchanges, &c.
- 2. Inclosure by private commission.
- 3. Inclosure by Act of Parliament.

1. Inclosure by Exchanges. In the northwest division of the Vale, the common fields and common meadows have mostly been inclosed, progressively, piece after piece; either in the original slips, singly; or more than one of them have been joined by purchase, or by private exchanges between the several proprietors: by which means the whole of the appropriated lands of the townships, in which this species of Inclosure has taken place, have been, in process of time, inclosed and held in severalty.

This method of Inclosure is attended with at least one disagreeable consequence. The

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common-field lands having lain principally in fingle ridges, fome of them, perhaps, near a mile in length, the Inclosures are badly proportioned. They are either too long for their width, many of them resembling lanes rather than fields; or, if cut into lengths, there are no driftways to the inner divisions:

—besides, much unnecessary fencing, with all its attendant evils, is by this mode of Inclosure incurred; and what is yet worse, each man's property is still, perhaps, scattered over the township.

2. INCLOSURE BY PRIVATE COMMISsion. Some entire townships (except perhaps the unstinted commons), and many stinted pastures, have been laid out by commissioners, chosen unanimously by the several interests concerned, without soliciting the assistance of Parliament.

By this means, the distinct properties are laid together, in well fized and well proportioned Inclosures, with proper roads and driftways; and this without the expence, the inconveniency, or the uncertainty attending an application to Parliament.

3. INCLOSURE BY ACT OF PARLIA-MENT. By this expedient, the advantages abovementioned are obtained in their fullest extent; with a train of attendant evils, which render this mode of Inclosure much less eligible, than that of inclosing by general confest.

This, however, is frequently impracticable: obstinacy has its adherents, in every township; and where various interests are concerned, as in the case of dividing unstimed commons, it is searcely possible that every interest, and every individual of each interest should be of one mind. Therefore, without some exertion of legal authority, unstinted commons, in general, must continue to lie open.

But it does not follow that, because some is necessary, much should be used. It may be received as a sound position, that in cases where an Inclosure would be highly beneficial to a township at large, a great majority of the individuals concerned would forward a measure, evidently calculated to promote their own interest; provided they could obtain it by some certain and known means. It is the idea of giving up a certainty for an uncertainty, of entering the list of contending interests, and of being outwitted or overpowered by their neighbours, which determen, whose fortunes are not desperate, and whose

whose dispositions are peaceable, from engaging in contests about Inclosures.

At present, a notice of a petition to Parliament, for the appropriation of unstinted commons, implies the war-hoop—bavock!—and he's the best fellow who gets the most plunder. And, until some GENERAL LAW OF INCLOSURE be established, this uncivilized mode of procedure must necessarily continue.

The multiplication of statutes has ever been spoken of as an evil; and though public acts may in general be meant, private bills may properly be included. There needs no apology, therefore, for venturing to recommend one Act of Parliament which would preclude the passing of a thousand.

Parish Bills of Inclosure must occupy much of the attendance of Parliament, and divert their attention from matters of more public importance. Besides, private interest, although it may not be able to exert its influence in Parliament at large, may be difficult to shut out, entirely, from its committees: but what can lower the dignity of Parliament more, than private interest being permitted, in any way, to warp its determinations?

That

That a GENERAL BILL OF INCLO-SURE might be framed, to answer the purpose of an equitable appropriation of commonable lands, in a much higher degree, than has been, or perhaps ever can be obtained, by separate bills, appears, to my mind, indubitable; and why such a measure has not long ago been adopted, would be difficult for any man, out of Parliament, to conceive.

It would be improper, in me, to dictate to Parliament, and might be wrong to offer my fentiments, too freely, in this place; but having ventured to censure the present mode of Inclosure by Act of Parliament, it is incumbent on me to convey some idea, of what I conceive would be an improvement.

In every township, FOUR DISTINCT IN-TERESTS claim a right of sharing in its commonable lands: namely, lands, houses, tithes, and the lordship. The two former have a benefit in commons, in their open state; but the benefit of the other two arises, solely, out of the Inclosure \*. Hence it follows, that

<sup>\*</sup> The tithe of wool, lamb, and milk, only excepted; articles of small value, compared with the tithe produce of lands, in a state of cultivation.

<sup>1796.</sup> If, in any case, as in the appropriation of marshes or fens, the estimate value of the tithes should be greater,

it is the consent and approbation of the two former interests, which ought to be obtained, previously to a change from the open to the inclosed state; for the two latter may be supposed to be always ready to receive proposals for an Inclosure.

It has already been feen, that when the tithe and the lordship are able to draw over to them a third interest, they can gain the desixed point. But the evil effects of Inclosures, thus conducted, have also been seen. Therefore, in fixing a general rule, for the QUANTITY OF APPROBATION requisite to an Inclosure, the other interests are more particularly to be attended to.

Were the lands and the houses equally situated, with respect to the commons to be inclosed, a majority of each might be sufficient. But this not being the case, in any township, a larger proportion seems necessary. Three fourths might, in many cases, be too small; but as Inclosures are, in all human probability, beneficial to the public, it might be impolitic to fix it higher.

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in the open than in the inclosed state, the owners of such tithes ought not only to have a differnment voice, but to have a suitable recompence.

Thus it appears to me, that, in framing a general law of Inclosure, three fourths, in value, of the land, and three fourths, in number, of the houses, with the consent of the lord of the soil, ought to be considered as the requisite QUANTITY OF APPROBATION.

Authorized and guided, by a general law of this nature, the business of Inclosure would be safe and easy. Every man, before he set out, would know, with certainty, his proportional share; and the Act would empower the several interests to make choice of commissioners, to secure to them their respective rights.

Numberless Inclosures remain yet to be made; and it were much to be regretted, that the attention of Parliament should be so unprofitably employed, and that the property of individuals should be subjected to so much hazard, as it is to be seared they will be, while common lands are continued to be appropriated, by SEPARATE BILLS, without any ESTABLISHED PRINCIPLES OF INCLOSURE.

Vot. I. date about H . softend FARM

<sup>\*</sup> June 1796. During the last session (1795-6), a Bill, of the intention here proposed, was brought into Parliament, by the President of the Board of Agriculture. But Parliament being dissolved, before the Bill had passed the lower House, it now remains in suspence, for the decision of the new Parliament.

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general law of Inclodure, there fourths, in

## FARM BUILDINGS.

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A the new Parliament.

I. THE BUILDING MATERIALS, which are now in common use, on this side of the Vale, are chiefly, portional More; and

Stones, -ntoo lo soiono Pantiles, missioners, to secure t their respective Deal:

But there are other materials, which require to be noticed; namely, rade; and it be regretted,

Bricks, that the attention of Cement, Could be o unprofitably camployedado

that the pro-

The stones, in use, are of 1. STONES. two kinds: freeftone and limeftone \*. The former

\* In the quarries from which these materials are drawn, the limestone generally forms the upper stratum, rising to within a few inches of the surface. The full, itself, is generally a limestone gravel; under which is frequently found a stratum of thin statelike limestone, that increases in thickness, as the depth increases; from one to four or ux inches thick; lying, in general, loofe and horizontal. These are the "walling stones" used in the faces of buildtagui Houle, it now remains in hybrence, for the decilion

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ings brick equa ftone perh: freef former being less perishable, are used for foundations, coins, cornices, and the coping of ridges and gables; the latter, being more easily raised, and requiring less labor in dressing them for use, are, in farm houses at least, generally used in facing the walls; and when properly hammered, and properly sorted, so as to give the thickest to the lower courses, lessening the size of the stones, from five or six to three or four inches thick, as the building rises, a much neater material cannot be employed; nor, if kept free from constant moisture, one which is more lasting, or which preserves the face of youthfulness so long.

2. PANTILES. Formerly, frow and a heavy kind of flate were the common coveraings; but, of late years, pantiles have become universal, for ordinary buildings; and blue flate for better houses.

In the fouthern counties, pantiles are confidered as an ordinary material: but the H 2 estimation

ings; for which use, one of their edges is hammered into a bricklike form: an operation somewhat tedious; but not equal to that of chisselling freestone. Under the walling stones, an irregular limestone rock (of many seet in depth perhaps) is usually sound; and, under this, a bed of grit, or freestone, of unsatherned depth.

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estimation of them, there, arises from an improper method of using them.; not from any intrinsic demerit of the material itself, when properly manufactured. From London to Grantham in Lincolnshire, scarcely a roof of pantiles occurs: north of Grantham, they are become the almost universal covering. They have two qualities sufficiently valuable to recommend them in any country: cheap-

ness and lightness.

Much, however, depends on the manufacturing, as well as on the laying, of pantiles. If the materials be not sufficiently exposed to the action of the air; or, if of diffimilar natures, though sufficiently tempered, they be not united fufficiently into one homogeneous mass, or uniform substance, the tiles that are made from them are liable to perish; not only before burning, as well as in the kiln, but after being exposed to the influence of the atmosphere, upon the roof of a building. Or, if the materials be good and well prepared, the moulds be truly made, and the moulding skilfully executed; - still, if they be fuffered to warp in drying, or to twift in being set injudiciously in the kiln, they are wholly unfit to be laid on, as a covering material; and every judicious workman refuses them.

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them. Were workmen, in general, or those who have the superintendency of workmen, more scrupulous, in this respect, than they generally are, manufacturers would be more diligent in their endeavours to approach the standard of perfection; by which means this, in many cases, most eligible covering might grow into universal estimation.

- 3. DEAL. In a District, furnished with three considerable sea ports, and a river navigation, it is no wonder that deal should have been long in use, as a building material. Floors have been laid with it, for near a century; and, of late years, it has been used for almost every purpose of building. Beams, joists, and entire roofs, are now, almost universally, made of fir timber.
- 4. BRICKS. Where stones are far to be setched, as towards the center of the Vale, bricks are become a common material. If brickearth be sound near the site of building, as it generally may in situations where stones are scarce, clamp bricks are considered, in this country, where coals may be had at a moderate price, as the readiest and (all things considered) the cheapest walling material.

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5. CEMENT. Formerly, ordinary stone buildings were carried up, entirely, with H 3 "mortar;"

"mortar;" that is, common earth beaten up with water, without the smallest admixture of lime. The stones, themselves, were depended upon as the bond of union; the use of the "mortar" being merely that of giving warmth to the building, and a degree of stiffness to the wall.

The event, however, proves that walls built without lime have, in many instances, stood for ages. Even part of the walls of PICKERING CASTLE, formerly esteemed a fortress of considerable strength, have been carried up with a cement, which, to appearance, seems little superior to common mortar: nevertheless, such is the effect of time, upon walls which are exposed on every side to the atmosphere, that they now hold together with considerable tenacity.

To this effect of time; or, more accurately speaking, to certain laws of nature which, in process of time, produce this effect; we ought, perhaps, to ascribe the stonelike contexture of the cements of ancient walls, rather than to any superior skill in preparing them.

The citadel, or central ftronghold, of the fortress under notice, has been built with better cements; which, however, vary much

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in outward appearance. One specimen, which I have collected, is a smooth chalklike substance; another, a coarse rough mass, composed of sand and small gravel, with a smaller proportion of chalklike matter.

In the fosse, which surrounds the outer wall, lies a fragment (perhaps part of the parapet or embrasures of the outside wall), whose cement has acquired a stonelike hardness, especially the part which is exposed on the outer surface \*.

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I have bestowed some attention on the decomposition of these four specimens. The results are as follow:

Exp. I. CEMENT OF PICKERING CASTLE:

—the coarser specimen, taken from the ruins of the central tower.

In general appearance, it resembles dirty chalk, thickly interspersed with small gravel; some of the granules as large as peas. Its tenacity that of common writing chalk; the asperities easily broken off with the singers.

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<sup>\*</sup> The age of this fortress would perhaps be difficult to ascertain. Part of the outer wall was repaired and some towers raised by (I think) Edward VI. But when the parts, which are here the subject of notice, were erected, is probably uncertain. They are said to be of very great antiquity; and are worthy of the research of the Antiquary.

One hundred grains, pounded, dried, immerged in water, and balanced together with the menstruum, lost in solution 25t grains of air, and yielded by filtration 40 grains of refiduum; which afforded, by elutriation, 35 grains of gravel and rough fand, and 5 grains of suspendible mudlike matter: the solution yielding, by precipitation, 64 grains of calcareous earth. It is included and mornes stone

1 1 100 x 35 grains of fand and gravel, 5 grains of filt, 64 grains of pure chalk,

104 grains.

From this analysis it appears,

1. That the proportion in this case (supposing crude limestone in lumps fit for burning to be of equal weight with fand and gravel) was three measures of unlaked lime in lumps, to two of fand and gravel.

2. That the fand and gravel, in this case, had been washed; either by the brook, which runs at the foot of the Castle mound, or more probably, by hand; the proportion of dirt being smaller than that which is generally found among drift fand.

3. That the lime had not regained the whole of its fixt air. The increase of weight, which which appears in the synthesis of this experiment, is a sufficient evidence, were it not corroborated, even unto proof, by the desiciency of air thrown off in the solution. To try whether the increase, on one hand, and the desiciency, on the other, agreed as to quantity, I resuspended 50 grains of the chalk obtained in this experiment: it lost exactly 23 grains in solution; as 50:23::64:29. Therefore, the increase of weight, in this case, appears to be wholly owing to the desiciency of air.

EXP. 2. CEMENT OF PICKBRING CASTLE;

—finer specimen of the central tower.

General appearance that of stale lime, run together with water, and baked to a crust; almost a pure white: surface rough; shewing the cells and the unbroken granules of the original lime.—Contexture, more brittle than common chalk; full of pores; the materials do not appear to have been well incorporated, at the time of preparation.

One hundred grains yield, in decomposition, twentyone grains of air.

42 grains of whitish grit,

5 grains of suspendible dustlike particles, '56 grains of pure chalk,

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to3 grains,

OBS. The residuum, in this experiment, is evidently the powder of freestone. The particles are small, and of irregular figures; very different in appearance (when magnified) from common fand. I was at a loss to afcertain their nature, until pounding some freestone, and washing it in the manner I had done the residuum. I found it to resemble exactly the fortytwo grains of washed grit of the experiment. It appears to have been pounded or ground very small, and to have been put through a fine sieve; the whole being in a state of grit; no fragment so large as a pin's head, which will be married

It is observable, that the cement of this experiment is weaker than that of the last: but whether from the nature of the base, or from the proportion of lime being less, or from the two united, is not evident.

It is also observable, that, in the decompofition of this specimen, a urinous smell rose, during the folution; and that the edges of the first filter attract moisture from the air. It is at present a practice, among some plasterers, to make use of urine in the preparation of platter. Althou steambaguit to misre

EXP. 3. CEMENT OF PICKERING CASTLE: taken from the ruins of the old outer wall facing facing the northwest. 'Collected in three or four different places; a few feet above the foundation; and mostly from the inner parts of the wall (where it has parted); not from the outer furface.

Its appearance is that of fandy loam, intersperfed with specks of chalk; some of them. larger than peas. Its fragility fimilar to that of dried brickearth.

One hundred grains of this specimen yield thirteen and a half grains of air.

30 grains of rough fand, and a few large fragments, the same bearing

37 grains of filt and fine fand, 36 grains of calcareous earth,

103 grains.

OBS. There are two causes of the weakness of this cement: the small proportion of lime, and the impurity of the base: a heterogeneous mass of fragments of various kinds, some of them apparently gypleous; of fands of different species, principally of a crystalline aspect; but chiefly of more mud, or of sand fo fine as to be impalpable between the fingers. It is therefore evident, that the materials, in this instance, have not been washed. And the Part of the Anderson

EXP.4. CEMENT OF PICKERING CASTLE: taken from a fragment in the northwest corner of the fosse.

In general appearance somewhat resembling the last noticed specimen; but in contexture very different. The crust of the outer surface, which has been exposed to the influence of the atmosphere, probably, during many centuries, has acquired almost the hardness of limestone; nor is any part of it to be broken with the singers: nevertheless, this specimen, also, is full of lumps of unmixed lime; some of them the size of small hazel nuts, and, at the time I took the specimen (the season wet), as soft almost as butter; when dry, they are of the consistency of very soft chalk.

One hundred grains of this specimen yield fifteen grains of air.

8 grains of fragments,

12 ---- coarfe fand,

36 - fine fand,

of a fizelike matter,

45 --- chalk,

104 grains. In Analist to the land to the land

Ons. The constituent parts of this residuum resemble those of the last specimen; except-

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excepting the absence of the mud, which has evidently been washed away; and excepting the presence of a mucilaginous matter, whose nature I am not at present able to guess; nor have I leisure, at present, to pursue the enquiry.

GEN. OBS. 1. All these cements, whether weak or strong, have laid hold of the stones with a degree of sirmness proportioned to their respective strengths. Every crevice of the wall is filled with cement: the whole form one united mass.

Hence, it is more than probable, that these cements have been poured into the walls, in a liquid state, in the state of puddle; and they appear to have operated, with respect to compactness, as the puddle of the canal-makers.

- 2. The subjects of Exp. 3. and 4. are strong evidences, that, in the preparation of these puddles, the antient builders were very desicient. Not more than half of the lime they contain appears to operate. The lumps, whether large or small, are more than wasted; weakening, rather than strengthening, the cement.
- 3. From the whole of these experiments, it is evident, that the several cements had acquired the principal part of their fixed air; chiefly,

chiefly, perhaps, after they were deposited in the buildings. The air in the stronger specimens bears a considerable proportion to the entire quantity of sement; and being infinuated, in the close state above-mentioned, may have added greatly to its compastness.

Hence, it is highly probable, that the stonelike tenacity of old cements is chiefly owing to the transmutation of lime and sand to calcareous earth and sand;—a substance resembling the original limestone.

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On examining a wall, which has been built with loam alone, without any admixture of lime, and which has probably stood about a century, I find that the loam has laid no hold whatever of the stones, and that time has made no alteration on its contexture. It is still the same friable substance, it probably was, the day it first became dry in the building; without having the smallest appearance of acquired tenacity, obtained during the century of time it has been exposed to the influence of the atmosphere.

It is therefore probable, that the atmofphere imparts nothing, voluntarily, of a cohesive nature to the mortar of walls which are exposed to it.

But it is more than probable, that cement,

containing a portion of lime, imbibes from the atmosphere something, which gives it a degree of tenacity, superior to that which it had on its first becoming dry in the wall, and it is a fact, well established, that lime begins to imbibe, the moment it grows cool from the kiln, that which the fire has deprived it of; namely, fixed air; which fixed air being imbibed, after the cement is deposited in the walls, is, probably, a principal cause of tenacity.

This being admitted, it may feem to follow, that the more quickly it is transferred from the kiln to the building, the greater portion of air will be imbibed, after it is laid in the walls, and, of course, the greater effect will time have on the tenacity or cohesion of the cement: and hence, we might be led to infer, that, if the antients had any superior skill in this matter, it consisted in their hastening the lime from the kiln to the building.

But, in practice, it is observed, that freshmade mortar does not set so well, does not cohere into a soft stonelike substance, so readily, as that which has been prepared some time before it be used.

This fact, perhaps, is accounted for in the lime having had, under this circumstance, time time to lay hold of the particles of fand, with which it is intermixed.

But, on the same principle, it seems to follow, that if the preparation be made too long before the mortar be laid into the wall, it will have regained too much of its fixed air, to lay hold, sufficiently, of the slones, or other materials, which it is intended to bind together.

Let this be as it may, it is common, in practice, when mortar is not used, presently after making, to cover it up closely from the outward air. It is the opinion of a person, who has paid this subject considerable attention, that, if mortar be buried within the surface of the ground, it may be kept twelve months in persection.

The same person, whose penetration and judgment, in the sew subjects he has more particularly employed his mind upon, are superior to those of most men, has struck out a new idea relative to the slaking of time for mortar.

Lime, whether it be intended for cement or for manure, ought to be reduced entirely to a dry powder. And, for cement, it ought to be mixed, in this state, evenly and intimately with the sand.

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It is difficult, if not utterly impossible, to reduce lime entirely to powder, with water alone; some part or other will always be supersaturated, and thereby be reduced to a paste; while the outsides, which are exposed to the atmosphere, will (unless the stone be extremely fine) fall in granules, not into powder.

Every piece of paste, and every granule, though but the size of a pea or a mustard seed, is useless, if not detrimental to cement; for, with these, the grains of sand cannot be intimately mixed; much less be coated with them; as they may, and undoubtedly ought to be, with lime in powder.

But if, instead of water, wet sand be used in slaking the lime; (piling it with the lime in knobs, layer for layer, and covering up the heap with it;) those evils are avoided: no part is supersaturated, nor are any granules formed by the action of the outward air.

Besides, another great advantage is obtained by slaking the lime, in this manner, with the sand with which it is intended to be incorporated. The two ingredients, by being, perhaps, repeatedly turned over, and by passing through the sieve together, never bot. I.

ceffarily become intimately blended; more intimately, perhaps, than they could be mixed, by any other process, equally simple. If the fand be washed (and all fand mixed with lime for cement ought to be washed) the labor of preparation is, by this method of flaking the lime, confiderably leffened.

But, in the preparation of cement, SLAK-ING THE LIME makes only one stage of the process; MIXING THE INGREDIENTS intimately, and uniting them closely together, into one compact homogeneous mass, is an operation which requires the strictest attention of the year, and and and another

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We have feen the uselessness of unburnt lumps of lime in cement; and the good effect of puddling cement has been at least conjectured. Line toyel to retal adouble

Compactness feems to be effential to the bardness of cement. When mortar is laid on with the trowel, it remains in the state in which it is laid, and does not run together into a close form, like melted metal or PIQUID CEMENT. 1 . and sor mistall ve

Much care, therefore, is requifite, in the preparation of mortar for the TROWEL. Working it, with the spade alone, is insufficient. Beating it with the edge of a board, a kind cellinity

of wooden axe, is more efficacious, but is very tedious. MILLS for the grinding of clay are common, and sufficiently effective of the purpose intended: but a mill, for the grinding of mortar, I have not yet seen, nor have I ever heard of such a contrivance.

6. OAK. This is, now, almost wholly laid aside, as a material of the house carpenter; except for door and window lintels, walk-plates, and some sew other purposes, which require strength and durability. The ports of Whitby and Scarborough take off the larger timber; and the resuse has, of late, been much in demand, for the purpose of inclosure. Deal has of course gained ground, as a building material. There are, however, some sew men, who still retain a sufficient partiality for the oak, to use it freely in every species of building, under a sull persuasion that, in the end, it will prove the cheapest material.

Having thus enumerated the materials of building, in most common use in the District, I will proceed to give some account of the BUILDINGS themselves; and of such operations, in rural architecture, as merit particular notice.

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II. FARMERIES. The spirit of improvement, which has so evidently dissured itself through this extensive county, is in no particular more conspicuous, than in Farm Buildings; nor, perhaps, does any part of it afford so many striking innovations, in this particular, as that which is under survey.

The Fancy Farm-Houses, which have been erected in different parts of it, I purposely pass over. Taste, whether true or salse, mere ornament without use, is foreign to the present subject: and I have, in another work, professedly on the subject of RURAL ORNAMENT, spoken my sentiments freely, on ornamental buildings.

In RURAL ECONOMY, straight lines and right angles are first principles, which can feldom be deviated from, with propriety; either in laying out a farm, or in planning Farm Buildings.

Here, the great object is to obtain the defired conveniences, at the least expence, prefent and future taken jointly, so long as the given conveniences may be required. To these principles we may venture to add,—the greater number of conveniences there can be included, in one building, the cheaper will those conveniences be obtained.

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There is a certain width, which can feldom be exceeded, with propriety, in Farm Buildings; but the nearer this width is approached, the greater quantity of conveniency will, in general, be obtained with a given expenditure. The long cube form, with the plain span roof, can never be dispensed with, without evident impropriety, in constructing Farm Buildings.

The number of Inclosures which have, of late years, taken place, and the spirit of improvement, which has gone forth upon the Wolds, have given existence to FARMERIES of almost every form and dimension.

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The practice of housing cattle in winter, which will be spoken to hereaster, requires a greater quantity of building, than that of wintering them in the open yard. But the quantity of barnroom requisite in this country, even on the arable farms, is much less than in the southern provinces, where barley and oats are harvested loose, and where the shovel, or the sail san, is used in the dressing of corn. Here, corn is universally bound, and the machine san in almost universal practice. In Norsolk, one man expects a sloor of sisteen seet by twentysour to himself; here, two men will thrash, contentedly, on a sloor, nine

feet by twelve; ten by fifteen is a full fized floor.

Such being the requisites of a Yorkshire Farmery, it is no wonder that the new ones, which have been erected, should be composed of a string of small buildings. They are generally formed into a square, open to the south, in imitation of those of other countries, where cattle are wintered in the area between the buildings, not in the buildings themselves.

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In one instance, I have observed the cattle hovels spun out, in such a manner, as wholly to inclose the dung yard. But the hovels, in this case, were only seven seet wide; not wide enough for cattle to stand across them; they being placed in them, lengthway, in pairs. The quantity of walling, the number of doors, &cc. and the quantity of roofing, with the subsequent repairs incident to low straggling buildings, render this, and every other plan which resembles it, altogether ineligible, in any District where cattle are wintered under cover. Wide houses, or open sheds, wide enough to permit cattle to stand across them, are in many respects preserable.

In opposition to the Farm Yard last mentioned, there is, likewise in this neighbourhood, an instance of the entire Farmery (of a small fmall upland farm) being comprised under one roof!

The fite is a long square. One end is occupied by a small dwelling place for a "hind," or bailiss; the ground sloor of the remainder, by a stable and cattle houses; over which are a barn and hay chamber; with a CHAMBER BARN-FLOOR! a thing I had not seen, nor conceived an idea of, before I observed it, in more instances than one, in this District.

This, just noticed, is the only one I have seen, in a new erection; I have, however, had full opportunity of observing the use of another, thrown over a cow house, in a large old huilding, which had long been used as a barn, stable, and beast house.

The advantages of a CHAMBER BARN-FLOOR are dryness, cleanness from dirt carried in with the feet, and security against pigs, poultry, and various accidents, to which ground floors are more liable: for thrashing wheat upon, chamber floors are obviously preferable to ground floors; most especially in low dirty situations,

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No effential disadvantage has yet fruck me, respecting a chamber thrashing-floor, but with respect to a CHAMBER BARN, there

If a barn be built against a rising ground, this objection falls, in part, or wholly. Even on plain ground, it appears to me that (especially where cattle are housed) it would be greatly overbalanced by the advantage of obtaining a suite of stables, cart house, and cattle houses, without the expence of roofing, in the first instance; and which, if substantially built, would last for ages to come without repairs.

The flooring of a chamber barn might, on the whole, be somewhat more expensive than that of a ground-floor barn; but the thrashing floors, if of plank, would be laid cheaper, and last much longer, in the former, than in the latter species of building; and the mow floors, if laid with clay on rods \*, would soon regain their extra cost, in keeping the bottoms of the mows dry and sweet; and in preserving it more secure from vermin, than ground floors generally do.

It is not my intention, even to intimate, that in corn countries, such as Norfolk,

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<sup>.</sup> See THE RURAL ECONOMY of NORFOLK, MIN. 15.

Kent, and other Districts, where cattle are wintered in yards, that chamber barns would be universally eligible; but, in a country like this, or in any country, or on any farm, on which grassland predominates, and where the housing of cattle is practifed. I see no sufficient objection to chamber barn-floors, nor to entire chamber barns. On the contrary, it appears to me, that, on small grassly farms, in low damp situations at least, they would be found singularly eligible.

But although a close yard is unnecessary, where cattle are housed, a single building, like that which was last described, is perhaps too simple, to be altogether eligible; especially in an exposed situation, where some degrees of shelter are requisite.

Two buildings, properly placed, would give this necessary shelter; one of them a barn, with offices under it; the other, the dwelling house, placed at right angles with the former: the two buildings touching at the corners only; forming two sides of a small yard with their ends, for hogs, poultry, &c. and a larger one with their fronts, for the dungpit, &c. with a small archway communication between them.

This, however, is intended by way of hint.

hint. To enter into the particulars of a plan, which I have not feen executed, would be breaking into the defign of the prefent work: nevertheless, it might be wrong to suppress this idea (which struck me while I was sketching a plan of a Farmery on the above principles) with regard to ASPECT.

It is usual, in planning a farm yard, to place the main line of building with its front to the south; in which case, two wings become necessary to skreen the yard from northeast and northwest winds; and perhaps this has established the common practice of inclosing a farm yard, on three sides, with buildings,

But if, instead of the back of a building being placed to the north, the angle of two buildings were directed to that point, the yard would be most effectually skreened from the north, the northeast, and the northwest wind, without an unnecessary multiplication of low narrow buildings, to eke out a third side with.

On a capital corn farm, on which a number of substantial buildings are required, three lines of building may be eligible; but on any small farm, or on almost any farm on which grass lands abound, two lines of building, forming a cheveron or carpenter's square, and and placed with the angle towards the north, would, in my opinion, be greatly preferable.

Another idea in RURAL ARCHITECTURE, new to me as that of a chamber threshing-shoor, I have seen executed, in a substantial manner, by two of the first occupiers in the Vale; namely, A GRANARY OVER A BARN FLOOR.

In all other barns I have seen, the space over the sloor, whether this be large or small, and whether the building be low or lofty, remains entirely useless. The idea of occupying the lower part of this space with a cattle house, as well as that of filling the upper part of it with a granary, have perhaps been originally and recently struck out, in this country +.

In the two instances in which I have seen GRANARIES OVER BARN FLOORS, the joists are supported by two beams, thrown across the building, and the stooring of the granary let

ratio the authority with with the

<sup>\*</sup> Except in one infrance, in which a very spacious building having been converted into a barn, joifts were thrown across out of the reach of the flail, and the mows continued over the floor.

<sup>+</sup> Since this was written, I have been informed, that, in fome parts of America, chamber barns, over cattle houses, are in common use, 1796.

let into the walls, at the ends; so that, notwithstanding the granaries may be surrounded with vermin, they are, in a degree, secure from their attack,

In the floor is a trap door, with tackle ever it, to raife and lower the corn from and to the barn floor.

The height, between the floors, is thirteen feet. This, in my opinion, is too great a height. Ten feet high is the most the flail requires \*, and every inch above that height renders the granary, in many respects, less commedious.

Confining the dust, which always rises more or less in thrashing, appears to be the only objection to a BARN-FLOOR GRANARY: I mean in a barn with pitching holes to house the corn at. But if VENTILATORS were made, immediately under the granary floor, with valves to open or shut as the wind should change, the health of the thrasher would, in all probability, be less injured, than it generally is, by this laborious and unhealthful employment.

Indeed, in this country, where tall, wide folding BARN DOORS are grown into disuse,

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See Nort. Econ. Mine 35.

vent holes of this kind are, in some degree, necessary to every barn floor. Even upon the Wolds, a corn country, the use of large doors is declining: some good barns have lately been built, with common-sized doors; one at each end of the floor: opening, however, in two parts, one above the other; so that the lower half can be shut, to keep out pigs and poultry, while the upper one is opened, to let in light and air.

This is a fortunate circumstance for the owners of landed estates: folding doors, large enough to admit a load of corn, are expensive in the first instance, and frequently require repairs; besides the thrashing stoor, be it of what material it may, being liable to great injury, in the act of drawing loaded waggons upon it.

Indeed, throughout, the YORKSHIRE BARN is characterized by frugality. In Norfolk, barns of one hundred and fifty to two hundred pounds cost are not unfrequently built: here, a very convenient one, and such a one as will satisfy a good tenant, may be built for forty or fifty pounds. What a saving is this, upon a large estate!

III. The OPERATIONS which require to be noticed are,

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- 2. The method of coping fidges and gables.
- 3. Eaves gutters.
  - 4. Water cisterns.
  - 5. Painting window leads.
  - 6. Mortar floors \*.
- 1. LAYING PANTILES. Formerly, it was the practice to hang pantiles upon the naked spars, bedding their ends in mortar, and pointing them at the sides, to prevent snow and rain from being beaten through, between them.

This method has two evil effects: lime is liable to expand, contract, and perish with the weather; to which, in this case, it is fully exposed. The consequence was, if the cement laid fast hold of the tiles, it broke them; if not, it slid from between them, and left the roof room exposed to the weather. The other bad effect of this method is, their being liable to be thrown off, in high winds, by the inward air being pent up, and finding an easy passage through this slight covering.

To remedy these two evils, it has, of late years, been the common practice to "sheet"

edition of the Opening Colors with require

<sup>\*</sup> Particulars which are interesting to those, only, who practise in Rural Architecture.

the roof; that is, to interlath, with plastering laths, between the tiling laths, and to cover the entire roof with a sheet of lime mortar: and over this, to lay the tiles on "dry;" that is, without bedding or pointing them; being careful not to suffer any part of them to touch the mortar:—to prevent which, the most effectually, a slip was nailed on, between the spars and the tiling laths, to raise the tiles sufficiently above the sheeting.

This method, which has been practifed some fifteen or twenty years, has been found effectual, against the two inconveniences above mentioned; but it has lately been found, that, in twelve or fifteen years, the laths begin to fail; owing, it is supposed, to their being placed too near the outward air; from which the lime alternately absorbing and imparting moisture, the laths become subjected to decay. I am rather of opinion, however, that this effect is caused by the tiling laths, checking the descent of the rain or snow water, which beats in between the tiles. Or it may be owing jointly to the two causes.

Be this as it may, an improvement has lately been struck out, which brings the art to as great perfection, perhaps, as it is capable

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of. This improvement consists in nailing the plastering laths beneath, instead of upon, the spars; laying the main coat of plastering above the laths, between the spars; afterwards, smoothing the under side with a thinner coat. This method removes the cement from the more immediate action of the atmosphere, gives a free circulation to the air and the water (which may be beaten in) between the tiles and the plastering; and, at the same time, gives neatness to the room beneath; without the expense, or the inconveniency, of a counter ceiling.

There is one very great conveniency arises from laying on pantiles dry. If, by the wind, or by accident, a tile be thrown off or broken, it may be replaced by a plowman, as well as by a professed tiler: a conveniency, which upon a farm, perhaps at a distance from workmen, is of no small value.

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2. COPINGS. Ridge Tiles, being laid entirely on mortar, and being exposed in the fullest manner to the action of the winds, are very liable to be thrown off; as well as to be broken by the weather: it is no uncommon thing, in places where ridge tiles are used, to see half of them displaced or broken; the heads of the spars having nothing

nothing but the thortar to hide them, without any thing to defend them from the weather. The ill consequence is evident.

In this country, where freestone which will fland the weather abounds, RIDGE STONES are in common use:

The form triangular; the half of a long fquare, divided diagonally. The base or broadest side is hollowed, to receive the top of the tiles: the opposite angle forms the ridge. The angles of the base are generally dressed off, to prevent the wind from laying hold of them; and to give them a more sing and neat appearance. They are set on with mortar, in the same manner as ridge tiles are laid.

The coping of gables, let the walling material be what it may, is usually of dressed stone, supported, at the foot, by an ornamental bracket of the same; projecting tent or twelve inches without the side walls; giving a degree of lightness, and an appearance of consequence, to the building.

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The end of the first stone of the coping tests on this corner bracket; the others, respectively, on those next below them.

There is an evil effect attends the common method of putting on these copings: the ends

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To prevent this effect, I have observed, in a few instances, an ingenious expedient practifed. The upper ends of the coping stones are pared down, to about half their common thickness (as from two inches thick to one), with a slope, sufficient to give descent to water, when they are laid upon the gable: and the lower ends have notches cut on their under sides, to receive the reduced points of the upper ends, about an inch beneath them.

By this expedient, the water is effectually got rid of, without endangering the firmness of the coping; but simplicity being, by this means, disturbed, the eye is displeased, with what however is, upon the whole, a very valuable improvement \*.

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Perhaps, giving the upper ends of the stones, a wedgelike form, and cutting bird's mouths in their lower ends, to receive the points, would be an improvement.

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On this fide of the Vale, the Morelands afford, in great abundance, stones well suited to these purposes: but, on the Malton side of the District, freestone is less abundant: nevertheless, such is the conveniency of inland navigation, the Derwent brings a supply of those useful materials, ready dressed, and sitted for use. And now, when inland navigations are become so prevalent, there is scarcely a district in the kingdom, which might not be supplied with them; from one place or other, at a moderate expence.

3. EAVES GUTTERS: The troughlets made use of to eatch rain water, dripping off the eaves of roofs, are usually formed by nailing two narrow slips of board together: but eaves troughs, made in that manner, are liable to warp, and become leaky at the joint; —the bottom; —the most essential part.

Here, they are pretty universally hollowed out of a triangular piece of wood,—with a round-mouthed adze. A piece, six to eight inches square, slit diagonally, affords two

K 2 triangular

<sup>\*</sup> The price of the stones, which are raised near Leeds, and carried, by water, down the Air, and up the Derwent, to Malton, are as follow: Ridge stones fifteen pence a yard, or five pence a foot: Copings the same price: Brackets two shillings and supence each.

triangular pieces fit for this purpose. The hollowing is not a work of so much labor as theory may suggest. They are usually made of deal. Gutters thus made are stiffer, and more easily supported,—are less liable to warp, and much less subject to leak,—than those made in the usual manner.

Kent, there are inftances of wells, three hundred feet deep. The expence of tackle, and the expence of labor, in raifing water, for every domestic purpose, and frequently for the use of stock, from this intolerable depth, would, it is natural to imagine, have long ago driven the inhabitants to some expedient, for collecting rain water: yet still they draw water out of the bowels of the earth; or, in very dry seasons, drag it perhaps three or four miles, uphill, in water carts!

In the island of Bermudas, and in some of the West India islands, the inhabitants have (generally speaking) no other fresh water, than that which they collect from the atmosphere, in tanks; and it is striking to see the small quantity of collecting surface, requisite to the supply of a family, with this necessary element; a surface which is small, in comparison pari hou

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parison with the roofs of a middle-fized farm house and offices.

In this District, in which water cifterns are growing into general use, especially in upland fituations, I have feen an instance where the dwelling house, alone, affords more than a fufficiency of water, for every use of the family. Nor is it the conveniency of having a constant supply of water, always at hand, which alone constitutes the utility of water cifterns. Rain water, preserved in quantity under ground, is pure and palatable in a fuperior degree: cool in fummer, and warm in winter. It is particularly grateful. to cattle; especially when they are ill: and it is highly probable that, as a menstruum of aliment in general, it is the most whalesome water, sound and regarded to some give mid

The fituation of a water eiftern is generally under the kitchen, or in a vacant corner of the yard, near the kitchen door.

The forms of water cisterns are various. The deeper they are sunk, the better they keep the water. The cube is perhaps the most convenient figure; but a double cube would perhaps keep water better. A cistern nine feet cubical would contain twenty-

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feven cubical yards, or about ninety wine hogsheads of water. L'asifie bna stueri

The materials of water cifteens, in this District, are clay, bricks, and tarras.

The method of making has lately received a confiderable improvement. When the art' was less known, than it is at present, an irregular hole was dug; the determinate figure of the ciftern being given by the walls; hehind which the clay was rammed. Now, the intended form of the ciftern when finished, is given to the excavation; whose sides are fquared and plummed, with the exactness with which a wall is carried up. On this wall-like face of the excavation, the clay is laid plaster-wife with a trowel, coat over coat, two or three inches thick; and against this firm even face of plastering, the brick work is raised. The bottom is, or ought to be in all cases, bedded with three or four inches thick of strong clay, beaten into a smooth even waxlike substance. On this stooring of clay, a double floor of brick is laid; and, on the margin of this, the fide walls are carried up, half a brick thick. The bricks are, I believe, invariably laid in tarras, eding bluow

The rovering is fimilar to that of a well; with a pump, or a roller and bucket. latter.

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latter, perhaps, the more eligible; especially if the admission pipe were carried down to near the bottom of the cistern; by which means the water, at the surface, would always remain undisturbed and pure.

- 5. PAINTING WINDOW LEADS. This is not introduced as a thing of importance: but the practice feems to be peculiar to this country. It gives a degree of neatness pleaning to the eye; and the paint is said to be a preserver of the lead. The color invariably white.
- 6. MORTAR FLOORS. A new species of cottage slooring has lately been thought of, and is now pretty commonly formed, in this neighbourhood.

The materials are lime and fand; mixed in nearly the fame proportion, and prepared in the fame manner, as the common mortar of bricklayers; except, that for forming floors with, it is generally made stronger, and is always made up softer, than it is usually done, for laying bricks in.

The method. The bed being prepared, the materials are carried on, in pails, in a state between paste and batter; laying them on four or five inches thick, and about one inch higher than the intended height of the

K 4

floor; to allow for the fettling, in drying, The whole being well worked over with a fpade, the furface is smoothed with a trowel; and, as it dries, is beaten, repeatedly, with a flat beater, to prevent its cracking; the workman, in this operation, standing on planks.

: A fortnight or three weeks of dry weather will render it fliff enough to walk upon

If, after the last beating, cross lines be deeply graven on the furface, a floor of cement has the appearance, as well as the ufefulness of a freestone floor.

6. Morran Picons. A new Species of catage flooring has lately been thought of,

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IN DISTRICTS abounding with upland grafs, we may expect to find ARTIFICIAL DRINKING PLACES for the use of pasturing stock. But no District in the kingdom will gratify our expectations to fully, in this refpect, as that which is now under observation. : 100H

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In this country, there are three species of artificial watering places:

- Made Pools, were started
- 2. Made Rills. No views in market
- date of 3. Field Wells. Standard and

I. MADE POOLS. The art of "pond-making" ranks among the most useful arts in Rural Economics. In many high situations, no other expedient can be practised, with propriety: rills cannot be raised, nor wells sunk and worked, but at too great an expence, for the purpose of watering stock.

On the hills of Surrey and Kent, ponds are made to hold water, tolerably well, with chalk, beaten firmly together \*: and in Norfolk, I apprehend, they have been formerly made with marl. In all countries where unfathomed beds of clay are common, drinking pools sufficiently retentive may, at a small expence, and without much art, be formed; and are, in general, sufficiently abundant.

But the art of making retentive pools, with CLAY, in loofe absorbent soils, is a recent discovery,

Physician Committee and the State of the Area Area Area

<sup>\*</sup> Experiments have, it is faid, been tried with chalk, upon the Yorkshire Wolds, without success; owing, probably, to the too great hardness of the Wold-chalk. A ductile soft chalk is fittest for this purpose.

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discovery, which has been hit upon in this District; in which it has made a rapid progress, and is now in universal practice, among farmers of every class. Indeed, for a country like this, where upland soil is kept principally in grass, it may well be considered as the most valuable discovery which has lately been made in Rural Economy \*.

There is little difficulty in making a pit hold water, with clay alone; provided it he kept up full to the brim; but once emptied, its retentiveness is lost. There are two causes of this loss of retentiveness:—the cracking of the clay by drought; and its being liable, whenever the water subsides, and even perhaps when filled, to be perforated by worms; which convert the bason into a filter, and for ever destroy its retentiveness. It is therefore necessary, that those two enemies should be guarded against.

To guard against the latter, a coat of LIME is spread, under the clay: above it, a coat of EARTH,

<sup>\*</sup> FRANCIS and ROBERT GARDINER, well-diggers and fish-pond makers, of Driffield, are entitled to much more than the credit of this discovery. The York Agriculture Society voted them a premium of ten pounds: were the Nation to grant them ten thousand, it would not be more than they merit.

SITU-

is laid; for the double purpose of guarding against drought, and for preventing the seet of cattle from injuring the CLAY; which alone is the cause of retentiveness; and on the proper ordering of which the art principally depends.

But many other particulars are requisite to be known, before the art can be sufficiently understood, to be practifed with certainty.

- The Run, or collecting furface,
- The Refervoir. 1 35 410 aid to
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1. THE RUN. A bare firm furface, as a road, collects the greatest quantity of water. A graffy surface retains the rain water which falls upon it, and which, in level situations, is conducted into the soil, by wormholes and other inlets, with which grassland generally abounds; especially in summer, when a collection is of the greatest value. However, if the subsoil be retentive, ditches, especially of arable inclosures, will frequently afford a supply, even in summer; but, in an upland

SITUATION, where the fubfoil is generally absorbent, a road, or an artificial run, becomes necessary. One not have delegant division

In upland Districts, as the Wolds of Yorkthire, and the Downs of Surrey and Kent, the furface is generally broken into hill and dale, and diversified by smaller vallies and inequalities. In fituations of this kind, ARTIFICIAL RUNS are most wanted, and may be most easily made. I have seen some faint attempts at making them, on the Wolds of this District, by cutting a few grips, with a spade, above the reservoir; but they were too few, too short, and too seldom scoured, to answer, in any considerable degree, the intended purpose. They, nevertheless, shewed plainly enough, the utility of channels for catching hafty showers, falling on graffy flopes, off which a confiderable quantity of water will escape, provided there be channels, at proper distances, to receive it. a di noqualla

To reap the greatest benefit from an artificial run, and to make it with the greatest eafe, form the bason at some considerable distance from the head of a valley; from which, down to the refervoir, open a main channel, by two furrows of a plow, turned outward. From this main stem, plow lateral

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branches, with an easy descent towards it, along the sides of the slopes, by single surrows, turned downhill; by which means the plowing will be rendered easy, the channels made free on the upper sides for the admission of water, and high on the lower sides for retaining it.

The plow would not be less expeditious, in scouring, than in making the channels: or, perhaps, a more sledge-like implement would be still more effectual, than the plow, in closing the sissures and wormholes, which presently are formed in watercourses laid dry; and which, if lest open, absorb an inconceivable quantity of water, before they be saturated; especially if the current of water be retarded, by grass, or other obstructions.

2. The Reservoir. The fituation of the reservoir depends principally on the run. Near the side of a road is, in general, the most desirable situation; provided a sufficient descent can be had, from the road to the reservoir. Roads leading along the sides of slopes can only afford a supply to the grounds on their lower sides. But, in this country, when a road leads down the descent, it is generally surnished, on both sides, with ponds; some of them, perhaps, not having more than a hundred

a hundred yards of run, off a narrow road way; yet, from that small quantity of surface, are sufficiently supplied with water.

In the fituation of a pond, there is one thing requifite, which does not feem to be attended to, even by the most skilful in the art. The requifite I speak of is that of admitting a waste-water place, on the upper side of the refervoir, to prevent the water, when the pond is full, from running through it; by which means it becomes filted up, unnecesfarily. For the nature of foul water is fuch, that, whenever it changes from a current to a stagnant state, it deposites a considerable part of its foulness; so that the water, which leaves a full refervoir, is finer, than that which enters it; the sediment of course being left behind in the refervoir. Whereas, if the current into the pond were to cease when the pond is fufficiently filled, the fediment of the overplus water would be got rid of. The pond would receive, in this case, no other foulness, than that which was given by the quantity of water, requifite to fill it \*.

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<sup>\*</sup> A finall CATCH POOL, between the run and the refervoir, would arrest much of the foulness of water, collected from a road; and, in a situation which could admit of

The form of the refervoir is, univerfally, that of a shallow bason, or more strictly speaking, that of a flat cone inverted; the sides shelving straight from the brim to an angle or point, in the center. If the excavation be made sixty feet diameter, its greatest depth is about seven feet: if forty feet diameter, the depth is about sive,—before the coats of clay, &c. be laid on \*.

The first business, in fetting out a reservoir, is to take the level of the site, and drive piles, as a guide in forming the banks, and in making the conducting channel, and wastewater place.

If the fituation be on a flope, the excavated mold is used in forming the bank, on the lower fide: if nearly level, the mold requires to be removed, or (if laid round the edge) the conducting channel to be raised.

If

of it, would be worth the trouble of forming. In many fituations, the mud it might collect, would amply repay the expence of forming it.

A refervoir fet out twentytwo yards diameter, by seven seet deep, will, when finished, measure about sixty seet by six, and will hold about two hundred and ten cubical yards, or near seven hundred hogsheads of water. Forty seet diameter by sour seet deep, when finished, contains sixtytwo cubical yards, or two hundred hogsheads (of sixty-three gallons, wine measure).

If clay or stone be excavated, it is laid separately aside, to save carriage:

If the lower fide be raifed with the excavated materials, they ought to be firmly worked together, or should lie a sufficient time to settle; otherwise, the fide, thus formed, is liable to settle, after the reservoir be finished; by which means cracks are formed, and a miscarriage ensues.

The excavation having received the intended form, its fides are made firm and smooth, for the reception of the lime:

merely that of preventing earth worms from perforating the coat of clay, the proper quantity depends, in some measure, on the nature of the soil. A fat rich earth, among which worms always abound, requires more than a dead hungry mold, or a dry stoney bottom; on which retentive pools are said to have been made, without lime. However, as no soil, perhaps, is entirely free from those enemies to ponds, it would be folly to risque a mifearriage, in any situation; as the expence of liming makes but a small portion of the whole expence.

The only preparation of the lime is that of flaking it, and picking out the cores; no fifting

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fifting or skreening being, in general, used; though obviously useful.

It is usually laid on with a spade or shovel; but a sieve would, perhaps, be found, by the inexperienced, a better tool; and the extra labor no object.

The thickness of the coat, laid on, is about half an inch. Half a chaldron of lime is sufficient to complete a pend of forty seet diameter. The principal part of it is laid on, beneath the clay; a few bushels, only, being reserved for scattering round the edges, to prevent the worms from getting into the clay \*.

Vol. L 4. CLAY-

\* A still more secure, and, on the whole, a more eligible method of liming has lately been thought of, and is now (June 1787) in practice, at Lockton (in this neighbourhood; by the Commissioners of Inclosure, in making PUBLIC DRINKING POOLS, for the use of the township. Instead of scattering the lime, in powder, it is formed, with fand, into mortar; a regular coat of which is spread; about an inch thick, not only beneath, and at the edges of the clay, but over the entire surface. This is an obvious improvement, which appears, to human forefight, to bring this method of forming pools near to perfection. The clay becomes cased, on either side, with a regular coat of cement, and is thereby fecured, in perhaps the completeft manner possible, from the attack of worms. The labor and expence, however, is by this method increased. A pond, nineteen feet diameter, took two chaldrons and a half 4. CLAYING. In this operation, the manual art, and the labor, principally center.

Upon the Wolds, clay is sometimes setched fix or seven miles; and is seldom sound at hand, in situations where artificial pools are most wanted: the carriage of the clay, therefore, generally becomes a heavy article of expence.

The choice of clay is thought to be less essential, than the working of it. Good ponds are said to have been made with common loamy mold; but it is wrong to depend on any thing, but a strong ductile clay, if it can be had, within a moderate distance.

The thickness of the coat, now pretty generally laid on, is about five or six inches, in the rough; beating it down to about three inches. In the infancy of the art, two coats of clay, of about that thickness, were laid on; but one coat has been found effectual, and much less expensive. However, it is probable, it will not prove so durable.

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half of lime, and five small cart loads of sand. Both the materials were sisted, and worked up, in the usual way, into mortar. Great caution is necessary in laying on the clay, in this case. If the mortar do not lie some time to stiffen, the clay displaces it: if it get too dry before it be covered, it is liable to crack.

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The method of beating will be difficult to describe; yet it most especially requires description.

The drier the clay is worked, the less liable it will be to crack with drought, when finished. In a dry season, however, it is necessary to moisten it: for which purpose the center of the pit is sometimes sinished, first, to collect the water of showers; the carriage of water being, in some cases, expensive.

In laying on the clay, the workmen begin at the bottom of the pit, and work upward; laying patch after patch, or circle after circle, until the brim be reached; taking great care not to carry on sticks, straws, dirt, or any kind of foulness, among the clay, or with their feet; and being careful not to displace the lime, in throwing it on: to prevent which the lime is not spread over the whole, at once; but is scattered on, as it is wanted to be covered with the clay.

A plot of clay laid on, and adjusted, it is beaten slat, with a wooden "mell," or beetle, made, at present, of these dimensions: the head sourceen inches long, and three inches diameter; the handle sour feet long, and suited in thickness to the hand of the work-

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man. Beetles of different fizes have been in use, in different stages of the art; but none of them have been found to be so well adapted to the operation, as that in use at present.

The first operation is performed with the side of the beetle, to level the protuberances, and smooth the roughnesses, so as to make the whole into a regular sheet of an even thickness.

This effected, it is struck, forcibly, with the end of the beetle, which is driven down nearly, but not quite, to the sime; leaving the surface sull of somewhat honey-comblike eells or dints. If the beetle be struck, unguardedly, quite through to the lime, a piece of clay, and a little lime, if required, is derefully placed in the breach, to prevent a defect, in the part thus injured.

The whole being gone over, in this manner, with the end, the surface is again levelled down, with the fide, of the tool; the workman walking backward.

The next beating is with the end, but not quite so deep as before; and the roughnesses being again levelled with the side, it is again worked over with the end; but still shallower than in the middle beating.

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The first strokes with the end of the beetle ought to close the bottom of the clay, firmly, with the lime and the bed on which it is spread;—the second ought to unite the middle of the clay with the bottom;—and the last to close, without a pore, the upper part with the middle;—and the last strokes, with the side of the beetle, ought to be sufficiently forcible to close, entirely, the dimples formed by the last-given strokes with the end.

If these several operations be thought insufficient, it is continued to be worked with the end and side of the beetle, alternately, until not a slaw can be found; the entire coat of clay being manufactured into a lead-like sheet, firm enough to bear a man without an impression, and a horse without injury \*.

5. COVERING. The first coat is of common earth, to affist in keeping out the drought, and to make a bed for the stones; to prevent their asperities from piercing, and L 3 thereby

<sup>\*</sup> When two coats of clay were in use, the upper one was laid upon the rough surface of the last end-beating; by which means the two coats became, by the subsequent beatings, incorporated in one thick sheet. A substantial method, this, of which the present appears to be rather a refinement, than an improvement.

thereby injuring, the fleet of clay. This coat may be three or four inches thick, according to the nature of the stones with which it is to be covered. If these be large and irregular, more earth is requisite, than when the stones are small, smooth, or slat. The leanest most infertile soil is sittest for this purpose. Worms and weeds are equally to be feared; and a rich soil is genial to both. In this point of view, two coats of clay are much preserable to a coat of clay, and a coat of rich mold.

Pondmakers seem not to be sufficiently aware of the mischievousness of weeds: indeed, some ponds will remain, for several years, in a manner free from them. But I have seen others, in which weeds, even docks (near the edge) have grown luxuriantly. It is probable that the tap-rooted weeds strike through the several coats; and, whenever the roots decay, a perforation must be left.

Mold taken from a dry found highland fituation is, in all human probability, less liable to propagate aquatic weeds, than the earth of a low fituation or a bog \*.

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<sup>•</sup> I have observed an ingenious and simple method of keeping the weeds under; especially at the edges, where they

The mold being rendered level and smooth, the stones are laid on: first covering the mold with the largest, laid with a flat side downward, to prevent their sinking down to the clay; and upon these laying smaller, until the coat be made five or six inches thick \*.

A PAVEMENT would be a more regular covering; and, if the stones were set in lime and sand, would not only prevent worms from getting into the mold, and upper side of the clay, when the pond happened to be dry; but would, in all probability, prevent weeds; and, when the pond required to be cleaned from mud, would be a regular stoor to work upon.

The only objection I have heard made to PAVING the bottoms of ponds, is, that it would be a temptation to cattle to go into

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they are generally most abundant. Though all the sides of a drinking pool be open, cattle will go to particular places to drink; and, in these places, the weeds are trampled upon and killed. Therefore, to check the rankest, the parts which are most free are covered with thorns, while those which are weedy are lest open, for the cattle to drink at

\* Straw has been used between the clay and the stones; and, in the instance (mentioned in a foregoing note) in which an improved method of liming was practised, a layer of thick fods was laid, grass-side downward, upon the lime; and, upon the sods, about six inches thick of loose stones.

the water, in hot weather; and, by standing there, would not only foul the water, but in time tread up the pavement, and injure the clay; whereas sharp loose stones prevent their going farther than the edge. If the stones made use of in a pavement were sufficiently large, the latter part of the objection would fall; and whether cattle standing in a pool, in summer, be detrimental or beneficial, may be a disputable point.

However, whether or not the infide of the bason ought to be paved, the rim should certainly be a broad smooth causeway, with a gentle grassy slope from it; especially on the lower side; that the cattle may approach the water, without wading in dirt, to the injury of the bank; and without having sharp loose stomes to walk and stand on, while drinking,

A drinking pool, formed by a skilful artist, full to the brim, free from weeds, and smooth round the edge, is, in a green pasture ground, as agreeable an object, as the eye can be entertained with.

6. SEASON OF MAKING. Autumn is efteemed the best time. Drought and frost are both enemies to new-made ponds. In autumn, drought has generally abated, and a sufficiency fufficiency of rain water may be expected in this season, to fill them before frosts set in. A covering of straw over the stones is the usual guard against the extremities of seasons.

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If a reservoir be formed in a slope, where the lower side requires to be raised with loose earth, it ought (as has been already intimated) to remain a considerable time to settle, before the coatings be put on: otherwise, it is liable to settle afterwards, and crack the clay. I have seen an instance of miscarriage through this neglect. If there be much made earth requisite to be raised, the excavation ought to be formed, twelve months before the claying be done.

7. EXPENCE. Although it is now twenty years fince the discovery was made, the art is still partially hid under the veil of mystery; and is not yet become familiar to common farm laborers. In this neighbourhood, ponds still continue to be made, by men from the Wolds; all of them, in reality or pretence, pupils of the first inventors.

These men generally work by the gross; the price being in proportion to the diameter: but they seem to have no regular method of calculation. Ten pounds were given, and may now be considered as a medium price, for twenty yards diameter \*; forming, claying, covering, and, generally, digging the clay, included: all carriage and extra labor being done by the employer.

A circle twenty yards in diameter contains in its area 314 square yards. Therefore, each square yard of furface costs, at this price, seven pencehals penny.

The folid contents of a cone, whose base is so feet diameter, and whose height is six feet, is 209.4 cubical yards; each of which costs, in the above instance, elevenpencehalfpenny.

Five pounds have been given for a pond, twelve yards in diameter: which is tenpencehalfpenny, each square yard of surface; and, supposing it sour seet deep, two shillings each cubical yard of water.

Three guineas were given for forty feet diameter, and four feet deep, the excavation having been previously formed. This may be called four pounds for the gross; which is

<sup>\*</sup> In the early days of the art, and when two coats of clay were used, twenty pounds were given for ponds of this dimension.

is about sevenpence a square yard of surface; or fifteenpencehalspenny, each cubical yard of water.

The men, in the last case, earned about three shillings and sixpence a day, without extraordinary exertion. In the first mentioned instance, the same workmen did not (according to their own assertion) make more than two shillings and sixpence, a day. But a large pond gives longer employment; and the business of pondmaking being uncertain and inconstant, travelling workmen can afford to make a large pond at a cheaper rate, than a small one.

The curve superficies, or superficial contents of the sides, of a cone twenty yards in diameter at the base, and two yards high, is about 320 square yards. This, in making a pond of those dimensions, is the quantity of coating: for each yard of which near 7<sup>1</sup>d. was given in the first instance, and less than 7d. in the last. Sixpence each square yard of surface to be coated, may perhaps be taken as a fair medium price.

To ascertain the quantity of coating, to be done, measure the exact circumference or rim of the pit, when finally formed and adjusted for claying: this dimension multiplied by half the the length (or depth) of the fide (measuring from the brink, down the slope, to the center) is the quantity of surface to be clayed and coated. The digging would (under this mode of calculation) fall proportionally heavier, on a large pond, than on a small one; but this would be counterbalanced by the advantage abovementioned.

The quantity of clay used, in the first instance, was about forty cart loads, setched about three miles; in the last, about sisteen loads, setched one mile. The quantity of lime, in the former case, one chaldron; in the latter, half a chaldron.

From the sum of these particulars, it is plain, that the larger the pond, the less, in proportion, is the expence. A reservoir, to contain two hundred cubical yards of water, requires little more than three hundred square yards of coating; whereas one, to contain only sifty yards of water, would require one hundred and twenty yards of coating: consequently, a cubical yard, of the former, would only cost (at ninepence a yard for manual labor, materials, and carriage) eighteenpence; while the same quantity, of the latter, would cost near two shillings and sixpence.

The UTILITY of Drinking Pools requires not

not to be dwelt on: but the SUPERIORITY of pools, made in the manner above described. to those which have formerly been made, by fome other art, or which have been formed by nature or accident, may with propriety be mentioned. During the dry feafons which have prevailed of late years, it has been obferved, that newly made ponds retain a supply of water, when the waters of other stagnant drinking places are dried up. This can only be accounted for, perhaps, by their perfect retentiveness, and by their being free from weeds, which convert to their own nourishment, and throw off daily by perspiration, a great quantity of water. Upon the Wolds their excellence was most conspicuous:while one man was driving his stock, three or four miles to water, his neighbours, who had "made ponds" upon their farms, were free from this ferious inconveniency. In many fituations, artificial Drinking Pools may repay the expence of making, the first dry season. Driving stock to distant water, in hot weather, and in a bufy feafon, is an expence, and a detriment to the flock so driven, which it would be difficult to estimate.

GENERAL OBSERVATIONS. — On examining ponds, in this neighbourhood, which have

have been made some years, the evil effect of covering with loose stones is evident.

For one, two, three, or more yards round their edges, according to the time they have been made, the use they have been liable to, and to the steepness of their sides,—the stones are entirely displaced, or trodden into the clay; which is, by this means, exposed to the feet of cattle, and to the open attack of drought and worms. For a while, the clay, even thus exposed, preserves its retentive ness; but, in time, it is destroyed, and the most valuable part of the pond entirely lost.

This effect is so probable, so evident to be foreseen, that, on first reflection, it seems astonishing so unsuitable a covering should be universally adopted. A cattle, when it goes into a drinking pit, necessarily throws the chief part of its weight upon its fore seet; which, in the act of drinking most especially, are placed, as for the intention of forcing, whatever they stand on, down the slope, toward the bottom of the pit. Upon loose stones, laid on a steep surface, cattle cannot make a step, or move a foot, without producing this effect, in a greater or less degree; and, by repetition and length of time, the entire coat (except some sew which happen

to be trodden into the clay) must, in the nature of things, be forced into the center.

But this practice, evidently abfurd as it undoubtedly is, in this District, was first established upon the Wolds, whose stone is of a perishable nature; a species of chalk; which, on being exposed to air and water, and to the treading of cattle, unites into a cement; which, forming a regular casing, preserves the clay from injury, for a considerable length of time. Loose chalk as a covering was, therefore, a good thought of the first inventors (indeed upon the Wolds there was no alternative); and it is not to be wondered at, that their pupils, mostly day laborers, should imitate the practice, in this country, by making use of loose stones.

Perishable or fost stones of any species, a strong rough gravel, or even sand, would, I believe, be better than loose hard unperishable stones.

But, in this neighbourhood, where stones of various kinds abound; or, in any country, where stones of a proper size can be procured, at a moderate expence; there appears, to me, to be no choice, with respect to covering. A regular FIRM PAVEMENT, strong enough to bear stock without an impression, would

would last through ages; and although the expence, in the first instance, would be something more than that of loofe stones, its durability would, in the end, doubly repay it. Even the Wold ponds, which have been made, fifteen or twenty years, are many of them beginning to fail, and will, in a few years more, require to be fresh coated: whereas, a pond properly paved would, in all human probability, remain perfect, for at least a century.

There would be an advantage of a PAVED pond, which may not strike every one. The clay and its coverings, while the pond is filled with air, appear to be a firm folid mass, which would require a great power to dif-But the pond being filled with water, the texture of the clay is changed, and the relative gravity of all the covering materials confiderably altered. They no longer adhere to the bottom with the same firmness, nor, in fact, lie upon it with the same weight, they did before the water was let in. For if, instead of stone, the clay had been covered with blocks of wood (for inflance), whose specific gravity was less than that of water, they would have rifen to the furface, and have left the clay wholly exposed: even

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Rones themselves lie, in water, with little more than half their weight, in air.

This propensity in the covering materials, when covered with water, to rise towards the surface, and the state of softness which the clay is reduced to, by a free communication with the water, render them very liable to be disturbed by the feet of cattle; while subternaneous water, after heavy rains, may insimuate itself beneath the clay, and not only disturb the lime, but raise up the clay, and affist in rendering the coatings still less firm; or, in other words, in promoting the general tendency of the whole, to form an artissical quicksand, or quagmire.

But if a pond were properly PAVED, while the coats were yet in a firm solid state, the pavement, being an inverted dome, and acting as an arch against their upward tendency, would preserve them, in that state, so long as the arch itself should remain perfect; which would, of necessity, be until the stones were worn out, or the soundation on which they rested should give way. For the pressure of the seet of the cattle being directed towards the center, would rather stiffen than weaken the arch\*; while the swelling

\* Hence, the steeper the sides of the Pool, the stronger the pavement.

of the clay and the soil (if any), with the water which would of course filter through the pavement, would assist in promoting the general union.

If irregular rough pebbles were used, the flattest ends should be placed downward, to prevent their injuring the clay, and the points upward, to prevent the cattle from sliding into the pond while drinking; as well as to prevent their standing upon them, after their thirst were quenched.

But stones hammered into a long-cubical form, like the Scotch stones now used in paving the streets of London, would make the firmest pavement; their upper edges or ends being left rough, for the purposes last mentioned.

It appears to me, that a well made pond, paved in the workmanlike manner, in which the streets of the metropolis are now in general paved, must of necessity remain perfect, until an eruption of the earth, or a general dissolution take place: provided the rim were, from time to time, repaired, to prevent the feet of cattle from breaking up the edge of the bason.

II. MADE RILLS. The heights of the northern margin have neither springs nor rivulets (some very few instances excepted),

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hor any other natural waters, than the brooks which wind at the bottoms of the deep vallies, that divide them; and the rivulets which generally run at the feet of the precipices, that terminate them:

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Formerly, these brooks and rivulets were the only resources which the villages, that are scattered on these heights, had for water, both for the use of cattle, and for domestic purposes.

In process of time, wells were funk; but they are of such a depth, as to make the labor of raising the water, little less than that of setching it, from a moderate distance.

This kind of natural necessity has led to an expedient, which, though not new in principle, is perhaps entirely so in simplicity of execution, and might be practised with great advantage, in many similar situations.

The moreland mountains rife generally with an easy ascent, from the beds of the rivulets last mentioned, to a height much exceeding that of the hills to be watered; and frequently abound with springs, almost to their highest swells.

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<sup>\* 1796.</sup> This was written, before I had feen the potwater leats" of Devonshire. See WEST OF ENG-LAND, art. FARMERIES.

These springs are collected, and conducted by a narrow channel, down the slope of the mountain sides, and along the face of the precipice, until the summit be gained; the waters being thence conveyed to the place or places desired.

In PLANNING an artificial rill, a level, and fome little knowledge of the country, are the requisite guides. The surveyor begins at the place to which water is required to be brought; and ascertains the lowest part of the brink of the precipice, from which water can be conducted. The face of the precipice is traced in like manner; and, if necessary, the ascent of the moreland hills; until springs, or their natural rills, can be commanded.

If his level bring him to the bottom of the steep, soon enough to catch the rivulet which runs at its soot, the work is readily completed. If not, he goes above its highest bend; generally to the head or highest part of the valley (between the heights and the morelands) and winds along the side of the opposite swell, to some more elevated source.

If, when he arrive on the moreland hills (or by an observation from the top of the precipice) he find that nature does not furnish

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the requisite quantity of water, high enough to give the necessary fall, the intention is of course frustrated,

In EXECUTING an artificial rill, opening a shallow channel, of a width proportioned to the quantity of water to be conducted, is the principal operation. In making flagnant pools, we have found, that much art is neceffary to make them retentive; but, in forming the bed of a rill, no fuch art is requisite. It is the nature of running waters to render the furface, on which they run, firm and retentive. Sand is, I believe, the chief material used in forming the channels of these rills; and this only in places, where an open rock, or other porous stratum, is croffed.

Much, however, depends on the quantity of fall, and the quantity of water. If the fall. be but little, and the quantity of water, at the fource, be fuch as not to admit of much waste, great care is requisite, in forming the bed of the rill.

The FALL is regulated, in a great degree, by the quality of the ground. On good ground, the channel is nearly level. Over faulty ground, the water runs with a current; for the double purpose of getting quickly over

M 3

over it, and rendering its channel the more retentive.

The principal ENEMIES of artificial rills are leaves, in autumn, and snows, in winter. To remove the obstructions, which these not unfrequently cause, and to repair such breaches, as time will always make in the works of art, a superintendant is necessary to every artificial rill.

THE RILL OF KIRBYMOORSIDE is, I believe, the largest, and was the first, which was brought upon these Heights\*. Since the introduction of this, several others have been raised; and some sew unsuccessful attempts have been made: the channel was, in one instance (that of Newton) extended a considerable way before the impracticability of completing it, at a moderate expence, was discovered; a piece of misconduct which nothing but a want of accuracy, in the use of the level, can lead to +.

The

This rill was brought to the villages of Gillimore and Fadmore, near forty years ago; and has been extended to Kirby, about thirty years,—by Joseph Ford; a felf-taught engineer, of great ingenuity and some judgment; a man to whom the country owes much.

<sup>†</sup> The miscarriage, in this case, was not owing to a want of elevation in the source, but to a depression of the channel

The first cost of the Kirby rill was not, altogether, one hundred pounds. The distance, about ten miles: watering (besides the town of Kirby) two villages, and a line of cultivated waterless upland country, about four miles in length.

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Besides the first cost, which was raised by subscription, a SUPERINTENDANT has tenpounds, ayear, for keeping it in repair, and free from obstructions; which yearly salary is paid by the voluntary contribution of the persons benefited; each being rated agreeably to the estimated benefit received \*.

M 4 III. FIELD

channel at the foot of the steep; the head of the valley (if such it may be called) being lower than the top of the precipice, at the given point. This shews the necessity of tracing the entire channel, with sufficient accuracy, before any other expence be incurred.

In the case of Kirby, the channel is raised, some feet, by a bridge-like mound of earth, thrown across the crown of the valley.

The same mound serves the purpose of conducting another rill, across the same difficult pass; from whence the Kirby rill takes an eastward, the rill of Wellburn (applied principally to the watering of pasture grounds) a westward direction.

\* In a bill, which is now before Parliament, for inclosing the commons and remnant common fields of the township, a clause is wisely inserted to establish a legal affessment for the preservation of this rill,

HI. FIELD WELLS. The skirts of the margin, formerly arable fields, but now grassland inclosures, were, on their being inclosed, equally destitute of natural and artificial watering places. Water for stock, however, was in a degree necessary; but the art of pondmaking was not then known. Wells were therefore sunk; the depth, twenty to thirty seet, according to situation. The water is raised, either by a pump or by a roller and bucket. The receptacles, stone troughs. Sometimes the well is sunk in the line of a sence, supplying two fields with water.

In fituations which are low and flat, yet dry, pools are difficult to be filled; and wells of course more eligible. They are readily sunk, and seldom dry, in such situations.

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## ROADS.

THE SPIRIT of improvement has, in no particular, made greater exertions, than in the FORMING OF ROADS. Within my own remembrance, all the roads of the District lay

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lay in their natural form; that is, in a state of slatness, in slat situations; or in hollow ways, on the acclivities of hills. Now there is scarcely a flat road, or a hollow way, lest in the country. The more public roads, at least, are now universally barrelled; the banks of the hollow ways having been thrown down, and the flat roads raised into a convex form.

Formerly, the floughs and inequalities were filled up, with a foft fort of gravel; which, being foon reduced, or finking in the mire, on which it was laid, only added to the quantity of dirt, and the heaviness of the road. Now, the universal COVERING, on this side of the Vale, is LIMESTONE, broken into small pieces, affording a rough but durable road.

But notwithstanding these exertions, and the quantity of labor and money which have been expended on these alterations, the roads are still far from being commodious, or even safe. The same folly of doing over much, which discovers itself, too plainly, in the roads of almost every District of the kingdom, is here manifest.

Roads can scarcely be raised too little: a gentle descent for rain water is all that is requisite requifite or useful, and constitutes the sole intention of raising them. And the only drain, the side of a road requires, is a mere channel, with outlets, to prevent the water, thrown off by the road, from collecting by the side of it,

Therefore, IN FORMING A ROAD, all the preparation requifite (previous to the covering) is to form such a channel, on either side, by paring down the outer edges of the fite; casting the foil upon the margin, or carrying it off, for some useful purpose. Not a spadefull of earth should be thrown into the middle of the fite, except to level inequalities. The convexity (the flope formed by the paring on either fide excepted) should be given, entirely, by the stones or other hard materials; which ought to be laid on a firm furface. If the fite be naturally unfound, the foil ought to be removed, or to be made firm by underdraining. For until a FIRM FOUNDATION be obtained, it is highly imprudent to be at the expence of laying on a covering.

Nevertheless, a general method of RAIsing Roads, in this and almost every other recluse District, is to dig a deep ditch on either side; to cast the loose earth into the middle of the site; and, on this, to pile a narrow bigh bigh ridge of hard materials. The effect is, carriages being necessarily confined to one track upon the ridge of the road, the materials, which are not pressed into the loose dirt beneath, are soon cut through, by the wheels of carriages always passing in the same ruts;—through which, the artificial bog, below, rises to the surface.

The method of REPAIRING is equally erroneous. Instead of the ruts being closed, by pecking in the ridges on either side of them, or by filling them with a few additional stones; the entire road is covered with a thick coat: and so often as fresh ruts are formed, so often is this expensive, and therefore doubly absurd, method of repairing repeated; until having laid coat over coat, and piled ton upon ton, unnecessarily, a mound of earth and stones, resembling the roof of a house, rather than a road, is formed,

The FORMING and REPAIRING of ROADS incur a heavy tax, on landed property; and the SAFETY of roads is a matter of public concern.

Some years ago, the Legislature paid confiderable attention to this subject, and extended their authority, perhaps, as far as could be done, with propriety.

. It might be difficult, perhaps, to frame a general law, for the FORMING of Roads; because different situations require different FORMS. In low fituations, a common drain, or a ditch, by the fide of a road may be neceffary; but, in absorbent upland fituations, neither of them are admissible: the road ought to fall, gently, to THE FOOT OF THE HEDGEBANK, on either fide, when it leads through a lane of a suitable width; or, to THE FOOT OF A MOUND OF EARTH, raifed (with the parings of the road) for the purpose, when the lane is too wide, or the road passes over an open country. In low retentive fituations, where deep DRAINS are requifite, fimilar mounds ought to be formed, as GUARDS to the SHORES OF DITCHES behind them; openings being made, at proper diftances, for the passage of the water collected by the road.

The CONVEXITY of a road ought to be fuch as will throw off the rain water, which falls on it, without endangering, in any degree, a top load.

Before a TOP-HEAVY LOAD can be overturned, the entire weight must be thrown upon the wheel or wheels of one side; consequently, the nearer it approaches to the dangerous dangerous equipoise, the greater injury the road will receive.

Thus, suppose a loaded waggon to weigh two tons. Upon level ground, each wheel would sustain half a ton; but, upon a shelving road, steep enough to bring the load to the equipose of overturning, the entire weight would rest upon two wheels, only; each of which would, in this case, sustain one ton; consequently, if we reckon pressure as injury, the damage done by a carriage, at the point of overturning, is twice as much, as that which is caused, by the same carriage, on level ground; and the nearer it approaches to one or the other of these extremities, the more or less injury the road will sustain by it.

Nor is the injury, the road itself is subjected to, the only evil effect of a steep-sided road. The ADDITIONAL FRICTION which is thereby caused, between the inner naves of the wheel and the body of the carriage, &c. (or between the iron work which severally belongs to them) gives an addition of resistance to the team; whose extraordinary exertion, on this account, is at once injurious to themselves, and to the road.

Most of the ROADS about the METRO-

ROAD between Gunnerby Hill, in Lincolnshire, and Ferrybridge, in Yorkshire, are, for road furveyors, proper subjects of study.

The furveyors of roads, in general, are as uninformed, or as inattentive, about the RE-PAIRING of roads, as they are about the forming of them. I all a the rather to be caused

Rurs are the principal enemies of a barrelled road. On a waved road they ferve as conductors to convey off the water: but, on a convex road, the descent of the water ought to be, immediately, from the crown to the channels on either fide.

The great art, therefore, in the MANAGE-MENT of CONVEX ROADS, is to form them, in fuch a manner, as to prevent ruts, as much as possible; and, if they appear, to be attentive in doing them away, before any material injury take place.

The obvious method of PREVENTING RUTS is to keep the road low, at the crown, and guarded, at the edges; fo that even top loads may be drawn over every part, with conveniency and fafety.

Upon the roads above specified, it would be difficult to endanger the most top-heavy load; except by running wilfully upon the hedgebanks. Every foot, from fide to fide, is travelable road; and every part impartially travelled over.

On the contrary, upon the roof-like roads; of this and other countries, the driver of a top-heavy load dare not leave the top of the ridge; and the drivers of loads which lie lower, for a variety of reasons, follow the beaten track: even horsemen, who are timorous, are afraid to leave it; and those who are not so, pursue it for obvious reasons; no other part of the road being beaten, or convenient to travel upon.

Of a road, properly formed, the immediate channel on either side (being a species of washway) is frequently the cleanest, sirmest, and, if freed from stones and other obstructions, the pleasantest horse path. But who, possessed of common prudence, would ride upon the tender brink of an unguarded ditch?

The effect is notorious: horses, and carriages of every kind, are equally confined to the same narrow track, upon the ridge; frequently consisting of two ruts and a middle path, with no better quatering, for horses which draw double, than there is in a narrow by lane, or over a rutty common.

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The method of KEEPING CONVEX ROADS IN REPAIR is not to permit them to be worn into ruts and holes, until they be impaffable, and then to load the whole furface, found or unfound, with a thick coat of materials; but to pay, from time to time, due attention to the wearing of them.

Ruts and hollows, which are yet too shallow to require to be filled in, should be opened, on the lower side, to prevent water from standing in them; but those, which are too deep for this operation, should be levelled in, without loss of time.

Upon stone roads, this may frequently be done, by collecting loose stones, and chipping off the neighbouring protuberances (equally dangerous on the surface of a road) and burying them in the hollows to be filled up; thus removing two principal evils of stone roads, in doing away a third.

But additional materials being, in many tases, requisite, they ought to be laid ready in proper recesses; for the purpose of levelling inequalities, as fast as they are made; and thereby preventing the evil effects of the worst enemy of a well formed road,—standing water.

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The road between Lynn and Wisbech, over the marshlands of Norfolk, is formed entirely of filt, a species of sea mud, so sine as to be scarcely palpable; nevertheless, with the precautions of keeping the surface free from standing water, and of levelling in the state and bollows, with a hoe, so fast as they are formed, it is, in wet weather, one of the finest roads in the kingdom.

I have observed, in other parts of the island, roads, covered with nothing but common fand, kept in good condition, by the same easy means. And the roads, which have been held out as patterns, are all managed, whether of gravel or of stone, in a similar way.

Indeed, all well managed TURNPIKE ROADS have men constantly employed upon them, for the purpose of repairing small breaches, in order to prevent large ones; and every TOWNSHIP ought to employ a ROAD-MAN, or WORKING WAY-REAVE, one or more days, in each week, throughout the year, for the same excellent purpose.

Instead of exhausting the whole of the statute duty (as it is called) in laying on coat upon coat, at some certain season of the year, and letting the roads lie until the return of Vol. I. N that

that season, as much neglected as if they did not belong to the township;—such parts, only, as are worn too thin, should be covered: a sufficiency of materials being reserved, and distributed in the most convenient manner, for repairing occasional breaches.

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Before I close this section, two particulars require to be spoken to:

The width of roads; and

The height of hedges on the fides of roads.

The Road Acts, passed in the thirteenth year of the present reign, order, that every "horse or driftway" shall be made eight seet broad; and every "cartway" leading to a market town, shall be twenty seet broad; that the lane of every "highway" shall be thirty; and the lane of every "turnpike road" shall be sixty seet wide; without specifying any particular BREADTH OF TRAVELABLE ROAD.

In some sew situations, as in the bottom of a narrow valley, between two hanging woods, and where a ditch and a mound of earth are requisite on either side of the road, a lane, sixty seet in width, may be, in some degree, necessary. But, in ordinary situations, that width incurs a waste of land, without any adequate advantage. Indeed, upon elevated

vated heights, and in other exposed situations, the traveller is thereby deprived of the shelter, which is required, and which a closer lane would afford.

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Nor does the loss of culturable land, and the circumstance of exposing travellers unnecessarily to the inclemency of the weather, constitute, in this and other cases of a similar nature, the sum of impropriety; grassy lanes are the greatest nuisance an occupier of land can have in his neighbourhood: and it would be well if some general law could be instituted, for their regulation.

In the last section, it was mentioned, that in the Sinnington Inclosure Bill; an admirable clause is inserted, respecting the grass of the toads to be set out. For the first ten years, no stock whatever are to be turned loose into them; nor, after that time, are they to be tommon; the surveyors, for the time being, having a power to let them, and apply the rent to the repair of the roads of the township.

With respect to the drying of roads, after rain, more depends on the HEIGHT OF THE HEDGES, than on the width of the lane. The crown of a barrelled road, thirty feet wide, with hedges kept down to four feet high, will dry, nearly as soon, as if no hedges were

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near it, and much fooner, than a road in the middle of a lane, fixty feet wide, with hedges and perhaps a line of coppice wood, as may frequently be feen, thirty or forty feet high, rifing on each fide of it; depriving the road entirely (unless when the wind happens to blow lengthway of the lane) of a free communication of air.

In low, and indeed in ordinary fituations, high hedges, on the fides of roads, are doubly hurtful: they are not only injurious to the road itself, but, in close weather, are offensive to the traveller, and very injurious to the beasts of burden and draught, which are employed upon them. The Highway Act therefore wisely orders, "that the possessors of the land next adjoining to every highway "shall cut, prune, and plash their hedges."

But this falutary clause has, hitherto, been very little attended to. In many counties, it would be difficult to find an instance, in which it has been obeyed, or enforced.

The magistracy of this county, however, may claim superior merit, in this respect. The road between York and Doncaster, near forty miles, is singularly well kept in this particular scarcely one licentious bush is

is left: and many of the less public roads of the county are laid open in a fimilar manner.

But excellent as this regulation undoubtedly is, in low as well as in ordinary fituations, — more especially where roads lead through old inclosed countries, in which lanes are frequently too narrow,—it would, if indiscriminately enforced, be greatly detrimental, in wide lanes and exposed fituations; where shelter, rather than a current of air, is desirable,

However, the execution of this law being in the hands of magistracy, its evil tendency may be easily checked, without injuring the more general intention.

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## SHORES \* AND EMBANKMENTS.

THE DIVERSITY of country, which the District under survey exhibits, requires

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\* SHORES. This term has been criticifed, through a want of its import being sufficiently attended to. It comprises not only sewers and other ARTIFICIAL SUR-

182

a varied exertion of art, with respect to sur-FACE WATER. Upon the hills, art is required, to retain it upon the surface; in the lower parts of the Vale, art is equally wanted, to basten it to the river, or general outlet.

It has been already mentioned, that much of the bottom of the Vale is, by natural fituation, liable to be overflowed by the rivers in times of flood. Nevertheless, every part of it, I apprehend, is fo fituated as to be capable of being laid sufficiently dry, by the rivers at dead water.

Therefore, the only exertion of art, in this case requisite, is, to open sufficient shores from the rivers to the grounds to be laid dry; sinking sufficient DITCHES, from the shores; and sufficient DRAINS, from the ditches,

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FACE DRAINS, but every NATURAL CONDUCTOR and RECEIVER of SURFACE WATERS. It is here used, as a GENERAL TERM, which is necessary in a work of this nature. It includes every Passage, Outlet, or Vent, that assists in freeing the SURFACE of the soil from collected water: whether it be a Kiennel or Strand,—a made Ditch or Sewer,—a Rivulet, Brook, or River of whatever magnitude,—or the Sea itself.

See the words sewer and strand, in the Provin-CIALISMS. (1796.) 8

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Many efforts, of this nature, have been made, with spirit and with success. The West Marshes, in general, are a striking instance: for although they lie upon a flat, and but barely above the level of the waters of the Derwent, they are, at present, kept principally in an arable state, and chiefly in wide flat beds. Nevertheless, by keeping open surrows, deep ditches, and clean shores, the land, in general, is lest as free from superstuous moisture, as if it were elevated a mile above the Derwent.

But the East Marshes (and some other smaller portions of the Vale) still remain a disgrace to the country; lying, chiefly, in a state of fenn—provincially "Carr;"—over run with sedges and other palustrian plants; which afford, during a few months in summer, a kind of ordinary pasturage to young stock. In the winter months, they are generally buried under water, and, in the summer months, are subject to be overslowed.

The remedy, in this case, (and in other cases of a similar nature,—of which almost every District in the kingdom affords an instance) is, to BANK OUT THE RIVER, which winds through the middle of it; and, in

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of Morr. To

doing

If, at the lower end of these shores, the RIVER lies sufficiently low, at the time of dead water, to receive, freely, the drainage of the marsh, the work may be completed, at an inconsiderable expenditure, compared with the magnitude of an improvement of this nature. Flood GATES, placed at the outlets, to give vent to the surface waters, collected within the site of improvement, and to prevent the waters of the river, in times of sloods, from slowing back upon it—are the only additional requisites.

If the furface of the river, at dead water, should be found to lie too bigh, for the necessary depth of the shore, Marsh Mills \*, placed in the lower parts of the site, will, in any ordinary case, do away the desiciency of fall.

The expence of a MILL is, in the first instance, considerable; besides an annual expence of repairs, and attendance. But supposing the first cost to be one or even two hundred pounds, and the repairs and attendance to be ten or even twenty pounds, a year, the whole expence would be inconsiderable, when

<sup>.</sup> See Norf. Econ. Min. 118.

when compared with the improvement of converting, perhaps, two or three thousand acres of unproductive fenny grounds, into ARABLE, MEADOW, and PASTURE LANDS, of five, or perhaps ten times its value.

In the case immediately under notice, mills, if requisite, could be effective on one side of the river only. The RIVULETS and BROOKS, on the north side of the Derwent, are too copious to be discharged by a mill. But, by embanking those rivulets, and by surnishing each compartment of the marsh with a mill, the desired improvement might, on a certainty, be made. On the south and east side of the Derwent, less difficulty would arise: the embankment of one rivulet, perhaps, would be sound the only addition requisite to the general improvement \*.

It may be unnecessary to say, that the excavated mold of the SHORES ought to go towards raising the BANKMENTS; thus obtaining, in one operation, the two principal means of improvement: or that main ditches ought

an apprehention is ill grounded. The city

<sup>\*</sup> Since writing this article, a meeting of the proprietors of these marshes has been held, to consider of an application to Parliament, for straightening and enlarging the bed of the Derwent! But the proposal was over-ruled.

ought to be led from the shore, into the area of the fite to be improved.

One thing, however, may not be fo.obvious: namely, the SITUATION OF THE BANKS, WITH RESPECT TO THE RIVER.

. If the BANKS be fet upon the immediate brink, as in general they are, they become liable to be injured, by the finallest deviation of the RIVER. Besides, the waters of floods being, by this means, confined (supposing a bankment on either fide) merely to the bed of the river, the banks require to be raifed to an unnecessary beight.

But if the lines of embankment be run at a proper distance from the river, as ten, twenty, or thirty yards, the BANKs are placed out of the way of danger, from the RIVER; and a greater area being left for the waters of floods to spread over, their rise will be proportionably less, and the requisite beight of bank will of course be lessened, in the 

Theory may conceive a roafte of land by this means; but experience shews, that such an apprehension is ill grounded. The embankment is equally beneficial to the land it encloses, and to that it shuts out from the river. The enriched waters of floods, now confined

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confined by the banks, deposit, on the inclosed slips, the particles which, hitherto, they had scattered over an extent of country. By this means the swamps, and hollows of the slips, are presently filled up; and, in time, the entire surface is raised.

I have observed an instance of this kind, in which the ground, on the river side of the bank, has been raised, near a foot, above the natural level of the ground, on the other side of it,

By this elevation of furface, the land is not only laid dry, but, if the waters be of a good quality, is at the same time enriched.

These slips, if of sufficient width, are singularly well adapted to the purpose of ozier BEDS: and are eligible PASTURE GROUNDS. The banks are places of safety, for stock to sly to, in sloods; a species of resuge they had not, when the whole lay open.

The EXPENCE of embankment, in ordinary cases, and under proper management, is far from excessive.

This Vale affords more than one instance of RIVER EMBANKMENTS. Browby moor, containing about three hundred acres of low marshland soil, over run, in an open state, with furze and rushes, together with some

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interspaces of sedgey grass, was liable to be overflowed by the river Seven, which runs on the upper side of it; the Rye, which washes it on the other side, being its natural shore.

These three hundred acres are the entire property of the EARL OF SALISBURY; and, in their open state, were let out in one hundred gaits, for young stock, at ten shillings each gait, producing his lordship; in that state, sifty pounds a year.

The embankment cost about fixty pounds; namely, about three quarters of a mile, at one shilling a yard. But the ruins of an old bank lessened the expence, in this case.

The bank, when finished, was about feven feet high; wide enough, on the top, for cattle to walk upon; sloped sufficiently to prevent its shooting, or being trodden down by cattle; and faced with green sods, to guard against the floods.

This improvement is worth tracing. Befides the embankment, which, if the old bank had not affifted, might have cost one hundred pounds, a road, through the middle of the site of improvement, was requisite to be formed;—the whole to be inclosed; and some erections to be made. Suppose the road, road, the inclosure, and the buildings to cost three hundred pounds, the whole expence would amount to four hundred pounds, or fifteen to twenty pounds, ayear:

The rent, in the first instance, was, I believe, fixed at eight shillings an acre. Three hundred acres, at eight shillings, produce one hundred and twenty pounds ayear; so that, in the outset, there appears to be a clear improvement of fifty pounds, ayear. In twelve or fourteen years, it may be worth twice that rent, the soil being deep, and of a quality which, though not rich, is suited, by situation, to both corn and grass. When the stipulated improvements are made, by the first occupiers, the three hundred acres will be worth, at least, two hundred pounds ayear; namely, FOUR TIMES ITS FORMER VALUE.

Another instance of river embankment occurs in this township. The commissioners, under the Act of Inclosure, have wisely secured the lower grounds to be inclosed, from the waters of sloods, which have, hitherto, occasionally overslowed them. The remedy, in this case, was easy: a partial embankment, only, was necessary; and the bank, in the parts where it was wanted, seldom required

Nevertheless, the advantage obtained, at this easy expence, is that of enabling the respective occupiers of the lands under inclosure, to change them, from a state of unproductive sward, to that of arable land; and, by that means, to improve them, perhaps, to three times their present value.

If, in the MANAGEMENT OF ESTATES, any superior faculty be requisite, it is that of being able to strike out and execute INTRINSIC IMPROVEMENTS; such as give a permanent increase of RENTROLL,—without diminishing the RESPECTABILITY of its owner.

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#### FENCES.

THE PARTICULAR articles which require to be noticed under this head are,

- 1. Gates, All to the total
- 2. Fence Walls,
- 3. Posts and Rails,
- 4. Dead Hedges
- Live Hedges.

I. GATES.

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I. GATES. The common field gates of this country are, in general, made flighter and much taller than those of other Districts. In Surrey and Kent, three feet eight or nine inches is the ordinary height of a gate; which is, there, composed of four common bars, and a strong top rail. Here, gates have generally six or seven bars, all equally slight; and the common height is sive to six feet.

Horses are the greatest enemies of gates. A low gate, let its strength be almost what it may, is no sence against a resolute powerful horse. If he can place the muscular part of bis chest sirmly against the top rail, scarcely any strength of wood can resist him. But if the top bar be placed high enough, to receive his windpipe, instead of his chest, his power of injuring the gate is, in a manner wholly, taken away. It is, therefore, no wonder that, in a country where the breeding of horses has long been a common practice, HIGH GATES should have grown into common use.

The HANGING OF GATES is an art little understood, even by the hangers of gates themselves; though highly interesting and useful in Rural Economy.

A person, here, who has paid unusual attention to the subject, and who has, in reality, made

made himself master of it, still continues to hang his gates upon proots, fixed at the feet of the hartrees \*1

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This was undoubtedly the original method of hanging gates, and is, perhaps, all things confidered, the best:

It is probable, that, in the infancy of the art, the foot of the hartree was itself formed into a pivot, while the upper part of it was confined to the post, or perhaps to a tree, with a rope of a withey.

In the instance under observation, the upper part of the hartree is hung, in the usual manner, with a hook and eye; and the foot of it is shod with a PIVOT OF IRON, set upon a large bard stone.

The great ADVANTAGE of hanging gates on PIVOTS is that of their being readily altered, with respect to fall, or catching: moving the pivot stone a quarter of an inch, this way or that, with an iron crow, is frequently a sufficient regulation: the pivot, too, takes part of the weight of the gate.

But gates, to be hung with pivots, require a peculiarity of CONSTRUCTION. Every gate, when

HARTREE; the principal end-piece, into which the bars are mortifed, and by which the gate is hung: opposed to the HEAD, the opposite end piece.

when shut, ought to hang plumb and level; that is, the head should be, everyway, upright, and the bars horizontal.

This requisite, however, and at the same time a proper fall, cannot be had in a gate made, in the fquare, and with a straight bartree. Either the lower part of the hartree must be crooked, or the gate must be made, out of the fquare; that is, the bars must stand somewhat obliquely, not perpendicularly to the hartree; and in this case the pivot must be placed, not in the center, but on the outside of the foot: the first to throw the point of the pivot behind the pin of the upper hook, to give the gate a fall when open at right angle; and the latter, to throw the point of the pivot without the pin of the hook, to give the gate a fall, at the post, and make it catch with certainty.

This being understood, it is easy to conceive that, if the lower end of the hartree be crooked, and if the elbow or convex side of the bend be directed, not to either post, but towards the middle of the gateway, the necessary falls may be had, without throwing the gate out of the square, or the pivot out of the centre of the hartree.

I mention this method of hanging gates Vol. I. O the the rather, as, notwithstanding its advantages, it is grown into almost total disuse; owing, it is very probable, to a want of knowledge of the proper principle of construction. I shall, in another District, have occasion to speak fully of the method of banging gates on books.

II. FENCE WALLS. The common homestall sence of this District is wall; either of brick or stone.—Battoning, in the Norsolk manner, is unknown, and close paling seldom made use of.

In the morelands, and upon the limestone heights, stone walls are the common field fence. Live hedges, are, in these situations, slower of growth, and more difficult to raise, than they are, in warmer better soils; whereas, stones are plentiful, lying, in some places, an incumbrance to the surface.

Inhospitable and unornamental as naked stone walls may feem, they are, in many situations, the most eligible fence:—cheap and durable.

They are of two kinds, "double" and "fingle:" the latter, which are composed of fingle stones, piled one upon another, are a fusficient fence against stock, provided they be raised high enough; but are liable to be thrown

thrown down, by the wind. The former, which are built in the common wall manner, but without mortar, are more expensive in the first instance; but, if properly raised, will endure for a length of time, with little or no Har, here, they are contained in a dering

The MODERN FENCE WALL, of which many miles have been built in consequence of the new Inclosures that have lately taken place, is of the following form and dimenfions. A singular ve ton the learn new the

The beight five feet. The width, at the base, twentytwo inches, narrowing to fixteen inches, at the top; which is coped (as a guard against sheep) with the widest and flattest of the stones, laid aside for this purpose.

A frame of wood, of these dimensions, is fet up, as a gauge, and as a guide to the builder, or og and makt dat do om er ste o

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The lowest price which has, I believe, been given for raising, carriage, and walling, is five shillings and fixpence, for a rod of seven yards. But a shilling, ayard, may be taken as a more medial coft. Each yard takes about a three-horse-cart load of stones.

III. POSTS AND RAILS. In most countries, the prevailing temporary fences are hurdles. Posts and rails are only used for the the defending of young hedges, and for other permanent purposes; being generally put down by a carpenter, and are seldom removed, until they become useless as a fencing material.

But, here, they are considered in a different light. They are (speaking generally) the only temporary fencing in use. If a piece of ground require to be divided, for one season, or for a few weeks, a line of posts and rails are run across it; not by a carpenter, but by a common farm laborer. And, when the purpose is answered, they are removed and laid up, for another occasion.

I mention this circumstance, as posts and rails are more durable, and a much better fence against horses and cattle, than hurdles are; and the labor of putting down, and removal, is much less than inexperience may imagine.

IV. DEAD HEDGES. The flake-and-edder hedge prevails in this District, and is, in general, constructed with uncommon skill. The superiority of construction lies, principally, in the eddering.

In other places, the EDDERS are trimmed up to naked rods: here, the spray, towards the top, is lest on. These sprayey tops, being wound

wound round the bodies of the succeeding edders, lay hold of the stakes, thereby preventing their rising. If the twigs of the edders be insufficient, brambles, or other pliable brushwoods, are wound in, with the same intent.

But the most effectual way of preventing cattle from throwing off the EDDERS, which method is here sometimes practised, is to carry on the two operations of eddering and filling together, burying the sprayey tops of the edders among the filling; by which means they are effectually secured from the horns of cattle; and even, while they remain sound, from the hands of hedgebreakers.

V. LIVE HEDGES. The management of hedges appears to me a matter of so much importance, in the management of an ESTATE, and is a subject to which I have paid so much attention, that I always find it difficult, whenever I sit down to write upon it, to confine myself within due limits.

In this District, I find ample matter to animadvert upon. The finest hedges in the kingdom (if any one particular spot can claim a superiority) are now growing in this neighbourhood; and more new ideas, respecting the management of hedges, have oc-

curred tome, in the District now under notice. than in all the others I have examined. It would therefore be wrong to treat the subject flightly, in this place. But I will endeavour to compress the matter, which I have accumulated, within as narrow a compais as may be alternated to for lands the from bery that

The fubdivisions which the subject, in this place, requires are:

- 1. The species of hedgewood.
- 2. The method of planting new hedges.
- 3. The method of defending them.
- 4. The method of cleaning and training.
- 5. Their after management.
- 6. The treatment of old hedges.

1. The prevailing HEDGEWOOD is the bawthorn. Formerly, it was in this, as in other places, gathered in the woods and rough grounds. But, at present, and for some years past, "garden quickwood" has been pretty generally, though not yet univerfally, planted.

But although the hawthorn is the common hedgewood of the District, and, in ordinary fituations, may be the most eligible. I have feen erabtree used on cold soils, as well as in bleak fituations, with great fuccess. In an instance where crabtree and hawthorn were

planted,

planted, alternately, by way of experiment, the crabtree plants have outgrown those of the thorn, in a striking manner. In six years, they have acquired stems as thick as the wrist, with tops sufficient as a sence, against ordinary stock.

Upon the Wolds, I have observed the elder, a plant which braves the bleakest situation, made use of as a hedgewood; but never saw it planted with sufficient judgment, to answer the intended purpose. Nevertheless, in the abundance and luxuriance of this plant, upon the most exposed parts of the Wolds, it is evident that, with proper management, it might at least be made a skreen to better hedgewoods.

The bolly I have feen raised (in the practice of a man who has paid great attention to the business of hedgeplanting, and in this particular with great success) with an unusual degree of rapidity and certainty.

The secrecy of the art lies in the time of transplanting: a holly transplanted, in summer, scarcely receives a check from the removal: a fact, this, which sew planters are aware of.—Thousands of hollies are every year destroyed, by removing them in the winter months.

2. PLANTING. The common method is to turn a fod, ten or more inches wide, upon the brink of the intended ditch, and, behind this, to fet the plants, in a leaning posture; covering the roots with some of the best of the mold the ditch affords; and, behind the plants, to lay the remainder of the excavated earth, in a low broad bank.

The ordinary ditch is very small; barely affording mold to back up the plants with. Neither the ditch, in front, nor the bank, behind, are considered, as they are in Norfolk, a guard to the young hedge.

The Pickering INCLOSURE BILL orders, that the ditches, in the lower grounds, when they are necessary as drains, shall be made four feet wide, and two feet and a half deep. But, for the uplands, no limits are prescribed; the distance, between the outer brink of the ditch, and the line of hedgewood, being the only thing limited. This width is fixed, throughout, at four feet and a half. In this case, the outer brink of the ditch being the boundary line of each man's property, and a narrow ditch, only, being wanted, a slip of whole ground is lest between the inner brink and the first turned sod, for planting the quick behind.

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One deviation, however, from this general mode of planting under the Inclosure Bill occurs. In this instance, a narrow trench, only, is dug against the boundary line; leaving fufficient room, between the inner brink of the trench, and the line of quick, to place the dead fence; by which means the owner of the land, getting his young hedges within his own premises, is no way liable to the illnature or negligence of his neighbours. And, instead of laying in the plants behind the first-turned sod, the ground is dug four or five feet wide, and the plants fet in a trench, upright, in the nurfery manner; having, in this case, a line of prepared earth on either fide to feed among.

Nor is this the only instance I have met with, in the District, of PLANTING HEDGE-wood on A LEVEL. The same judicious planter has, in dividing upland inclosures, planted hedges without any ditch whatever. His practice has been to plow a slip of ground, on each side of the intended line of the sence, the preceding spring; and having previously dunged it, to plant it with potatoes. During summer, the land is repeatedly cleaned with the hoe; in autumn, the potatoes being removed, the entire slip is gathered into a ridge,

a ridge, with the plow; and, the ensuing spring, the quick is planted, nursery-wise, in a trench, run along the middle of the ridge. The success of this method has proved equal to what might be expected, from management so obviously judicious.

Another new idea, which has been struck out, and carried into practice, by the same person, is that of sorting HEDGEWOOD PLANTS; not according to the thickness of their stems, or the fize of their tops, but agreeably to the strength of their roots. When the plants are put in, indiscriminately, the strong soon outgrow, and overpower, those which are weaker. But plants, which are judiciously forted, rise together, without destroying each other. Besides, in doing this, many worthless plants are thrown aside, and those which are weak are reserved for fuitable fituations; while the strongest are planted where the greatest strength is reguired.

But the boldest idea I have met with in hedgeplanting is that of BURYING THE PLANTS! by covering up their heads, an inch or more deep, with mold: and this, not as an experiment, but in the practice of a common laborer.

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The method of planting, in this case, is the common one of setting the plants behind the "cape-sod," or sirst-turned spit. But instead of leaving the heads two or three inches above ground, the plants are shortened, and the heads placed about an inch below the surface.

Observing a work of this kind, presently after it was executed, I waited with impatience to see the event. In due season, the plants made their appearance; not in a number of irregular spreading shoots, as from an exposed head; but rising, with one, or perhaps two or three, straight upright shoots, of peculiar strength and beauty.

They did not, however, rise at the same time; some of them remaining in the ground, several weeks, after the earliest made their appearance. The covering of mold, therefore, ought, perhaps, to be as fine, and laid on as light as possible, to prevent obstructions to the tender shoots in rising \*.

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On close examination, I find, the tallest strongest shoots rise from such as were barely, or perhaps impartially, covered with mold: such as were buried deeper are, at present (in the month of August, the first year of planting), shorter and weaker; owing, perhaps, to their rising later in the spring. It is therefore probable that the lighter and thinner

The advantage of burying the plants appears to be the valuable one of giving the young hedge an upright tendency, and thereby preventing the strength of the roots from being expended, on useless side shoots. Plants, thus raised, take the growth, and probably the habit of SEEDLING plants. The roots, in this case, may be considered as PREPARED SEEDS, surnished with a peculiar strength of vegetation.

3. DEFENDING. Posts and rails are the common dead fence. Sometimes one, sometimes two rows: a most expensive way of defending a young hedge.

In the lower parts of the Vale, where stones are not too numerous, and where deep ditches are requisite, the Norfolk method might be introduced with great propriety \*.

But, in stoney soils, that method is impracticable: and, there, two rows of posts and rails, or some other dead sence adequate to them, are, in most cases, absolutely necessary to good management.

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thinner the covering, provided it be fufficient to prevent fide shoots, the more eligible is this practice. Sorting the plants, too, agreeably to the strength of their roots, is prohably requisite.

<sup>\*</sup> See Non'; Econ. Sect. Live Henges, Subd. V.

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It is therefore wife, in the framers of Inclosure Bills, to secure the right of placing sences, during a certain number of years, upon neighbouring allotments, as guards to the young hedges \*.

I have observed, in more than one instance, the good effects of setting a sharp ridget of earth, on the outer brink of the ditch, as a guard to the face of young hedge plants; especially against horses. In one instance, a young hedge was defended by two small ditches, one on either side, with banklets of this kind, without any dead sence whatever; and this, too, against well bred hunters: such as would, in a chace, have taken the hedgling and both ditches, without hesitation. Cattle are less terrisied with these devices.

The practice of pricking thorns into the first-turned sod, upon the inner brink of the ditch, as a guard to the face of the quick against sheep, affords a degree of temporary security; but deprives the plants of that air and exercise, which is necessary to a luxuriancy and firmness of growth.

4. TRAINING. This department of the management of hedges is too much neglected,

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<sup>\*</sup> See Sect. INCLOSURE, p. 79.

in all countries. The planting, and the first erection of guard fences, generally receive a tolerable share of attention. But repairing these fences, from time to time,—destroying weeds,—and giving the young plants a proper tendency, are matters which are seldom considered as essential to success.

In this District, the front fence is, in general, too little attended to, or neglected too long; the young plants being frequently brouzed and stinted, before the necessary guard be thought of, or placed.

With respect to weeding, however, the District is above mediocrity. But in regard to training the plants themselves, by striking off the luxuriant side shoots, and thereby promoting the upward growth of the hedgling, it is very deficient.

I have, nevertheless, had frequent opportunities of observing one instance, in which this requisite business, in the raising of hedges, has been executed in, perhaps, a singular manner. In this instance, each plant is trained with a single stem,—pruned in the nursery manner.

One advantage, of this method, is that of rearing every plant, with a degree of certainty; the tops being, in this operation, attended

to, as well as the stems: those of the stronger plants being lessened, to give head-room to the weaker.

Another very great advantage, especially on a sheep farm, is that of getting the young plants out of harm's way. Sheep are dangerous enemies to young hedges; and every expedient to guard against their mischievousness, in this respect, deserves at least a trial. Strong plants, judiciously planted, and trained in this manner, may, with a degree of certainty, be got out of the reach of sheep, in three or four years.

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The labor is confiderable, but by no means excessive. In this one instance, the expense of labor appears to be greatly exceeded by the advantages obtained by it.

The pruning should be done in winter or spring, while the sap is down; or while it is rising; not in the summer season.

5. AFTERMANAGEMENT. In this department, the District under survey excels: not in the manner of cutting, but in the frequency of it. Many young hedges are cut, before they are twenty years old; and the cutting, of such as are thriving at least, is usually repeated, every five or six years; a practice which ought to be universally sollowed.

lowed. Nothing is more injurious to a hedge, than unfrequent cutting.

The prevailing method of cutting is that of "buck-heading;"—namely, cutting the stems off level, about three feet high above the level of the inclosure; generally winding a few straight boughs, horizontally, between the heads of the stems, to prevent stock from forcing through between them. A more simple, or a cheaper method than this, cannot, perhaps, be devised; especially as the ditch is seldom touched; the roots being purposely suffered to strike across it; by which means they enjoy free pasturage on either side.

On the Malton fide of the District, the prevailing method of cutting is that of plashing, in the Midland manner: an operation which I shall have occasion to speak fully of, in its proper place.

6. OLD HEDGES. The practice of replanting wornout hedges, in the Norfolk manner, I have not met with, in this District.

Stopping breaches with dead hedging, thereby effectually preventing their ever closing again, is a piece of unpardonable management, which is nowhere more prevalent, than in the Vale under observation.

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One instance of exertion, however, in order to RECLAIM a live fence, from a row of large old thorns, the remains of a neglected hedge, occurs in this District, and would do credit to any country. It is the only one of the kind I have met with.

The bushes, or separate detachments of the old hedge, being trimmed, on both sides, and the main stems cut out, at the ground, or headed at such heights as circumstances required, the long slender boughs, growing in the line of the sence, were trained into the vacancies, with strong stakes, in the ESPALIER MANNER: a bank of earth having been previously thrown up, and the lowest ground-boughs LAYERED in it, in order to strike root, and send up fresh plants, to assist in filling up the vacancies, effectually.

This mode of treatment is not applicable to such hedges, only; but to every live hedge, in which wide VACANCIES are found. The best time for filling them up, in this manner, is when the hedge is felled to the ground.

Another instance of practice, in the management of old hedges, which had been planted on broad banks, with ditches on either side; and which, through the narrowness of Vol. I. P

the pasture, and the neglect of timely cutting, were become stunted, and thin of stems, merits notice.

The thorns, in this case, were felled to the ground; the ditch, to the fouthward or westward of the hedge, re-made; and that, on the north or east fide of it, filled up with the excavated mold. By these means, the plants were fupplied, immediately, with fresh pasturage in made earth; and let loose to feed, at large, in the adjoining inclosure. The effect is striking.

Perhaps, REVERSING THE DITCH of an old hedge (with a fingle ditch) might INVI-GORATE it, in a fimilar manner, by giving the plants a fresh field of pasturage. The experiment, however, ought to be tried with Depriving old plants of all their caution. main roots (though they were at the fame time cut off by the ground) might be dangerous.

GENERAL OBSERVATIONS. From what has been faid, on the ordinary treatment of hedges, in this neighbourhood, it is evident, -that their superiority is not owing to an excellency of management. The richness of the foil; the neglect of the ditches; the frequency of cutting; and, above all, the pre-

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fent AGE of the hedges, account sufficiently for their PRESENT FLOURISHING STATE.

Those which strike the eye with a peculiar luxuriancy of growth, are about FIFTY YEARS OLD: and it is abundantly evident, that hedges, growing in a good soil, may, until they have reached that age, be headed fence-high, with a degree of safety. But, on a nearer view, it appears to me equally evident, that the practice cannot be exercised, in perpetuity, with any degree of propriety.

On examining hedges, which have not been planted SEVENTY YEARS, and which have been treated invariably in that manner, I find they have already received irreparable injury. The underling plants are, already, so far destroyed, as to leave vacancies, of three feet or more in width; while the master plants, now no longer of themselves a fence against sheep, have acquired stems of a tree-like size.

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eent FELLING TO THE GROUND, and training a range of new stems, is the only effectual remedy of this evil. But this, when deferred too long, is impracticable, or at best uncertain. Large old stems will not, always, survive the operation; but if applied,

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in time, and with due care, the remedy is certain.

It would be difficult, perhaps, to prescribe rules for FELLING HEDGES TO THE GROUND, by their ages, or the intervals of time between the fellings. Perhaps, no hedge ought to stand more than FIFTY YEARS, from the first raising, nor more than THIRTY YEARS, between the fellings.

But, by their SIZES, and the state of their growth, some general rules may with propriety be mentioned. No stem (howsoever healthful, nor how sizeable soever to the neighbouring stems), of more than a foot in circumference, ought to be suffered to remain standing.

If there be a great disparity, as there generally is, in the sizes of the stems, either the entire hedge ought to be felled, before any of them acquire the limited size; or, in heading them, the larger ought to be shortened, proportionably to their respective sizes; in order to lessen their destructive tendency, and to give the weaker an opportunity of gaining, at least, a temporary ascendency \*.

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An expedient of this kind I have feen executed with every appearance of fuccess.

If the plants, let their age and fize be what they may, grow mossy, or wear the general appearance of stuntedness, they ought to be removed, that a more healthy race may be trained up, in their stead.

The same as to HEADING. No particular age can be pointed out, for the first cutting; nor can any certain interval of time, between the headings, be prescribed, with strict propriety. Soils and situations insluence the growth of trees; and, viewing the management of hedges in a general light, the tops ought to acquire a degree of USEFULNESS before they be taken off.

A bough, fix or eight inches in circumference, is large enough for a stake; and, when the strongest have got to this size, the remainder are generally sit for the fillings of dead hedges; that, therefore, is the state in which they ought to be cut.

It would, in my opinion, be better management, in a man who occupies his own estate, to burn them, and give their ashes to the winds, than to suffer them to remain on the stems, after they have reached that size.

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But, in a tenant, who has no permanent interest in the hedges he occupies, neglect is

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less criminal.—It matters not, to him, whether the live hedges upon his farm remain sufficient fences, one or two centuries. He is no way concerned in the purchase value of the estate, unless it be in the depreciation of it. His plan of management (if he has any in this respect) is to make his hedges subservient to his own interest; especially when he has no certainty of continuing in possession.

These circumstances are not mentioned, here, with a view of breeding ill-blood between landlords and tenants; but to endeavour to convince the former, that it is incumbent on them to pay some attention to the live hedges upon their estates.

It is now a custom, pretty generally adopted, upon wooded estates, to appoint woodwards, for the preservation of timber and underwood.—And, upon every large estate, lying in an inclosed country, it is, in my opinion, equally necessary to appoint a HAYWARD, for the preservation of its hedges.

An EXPERIENCED HEDGER would, perhaps, be the fittest for this employment. In ordinary cases, as where heading, only, might be requisite, orders might be sufficient; but to the raising of new hedges, and the renewal

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of old ones, personal attention ought to be paid, not only to the planting and the felling, but to the fencing and the weeding, until the new or the renewed hedge be out of danger.

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## HEDGEROW TIMBER.

THIS is an interesting subject to the proprietors of inclosed estates: and no country affords a better field for observation, than that under survey.

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The old-inclosed parts of this neighbourhood, when seen at some distance, have the appearance of woodlands; the inclosures being mostly narrow, and full of hedgerow timber.

The age, on a par, is about fifty years. In half a century more, the value of the timber, of some parts of it, if suffered to stand, will probably be equal to the value of the land: a circumstance, this, of no small import to the owner. But the detriment to the occupier requires to be considered.

In this country, it feems to be a general idea, founded perhaps on experience, that

lofty hedgerows are beneficial to grass land; increasing its productiveness, by their warmth, and giving shelter and shade to pasturing-stock. The roots, even of the ash, are considered as inoffensive to land, in a state of grass; in which state, the grounds thus loaded with hedges and timber trees, is almost universally kept.

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Indeed, it would be impossible, in their present state, to occupy them as arable land. There are entire inclosures, every foot of the areas of which must necessarily be occupied by ashen roots; nevertheless, they give an ample supply of hay and pasturage. One to two tons of hay an acre. And, in many of them, three acres will afford sufficient pasturage, for two cows, of the largest size. The rent, from thirty to forty shillings an acre. Strong evidences, these, that the roots of the ash are not very injurious to grass land.

It is evident, however, that the oak, when fuffered to thrust its low spreading head into the inclosure, is injurious to the herbage beneath it; that the leaves of the ash are very detrimental to aftergrass; and that the hedges are annually receiving irreperable damage;—no general plan of training up the trees, with tall stems, having, I believe, in any instance been adopted.

GENERAL OBSERVATIONS. From what is here mentioned, we may conclude, that the advantages accruing from the planting of timber trees, in the hedges of inclosed commonfields, of a soil, and lying in a situation, adapted to grass,—are far superior to any disadvantages arising therefrom, even where they have been suffered to grow, in a state of almost total neglect.

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Land which has lain open, and which has been kept in a state of aration, during a succession of ages, is equally productive of grass and trees. And it is generally good management, to let it lie in grass, for some length of time, after inclosure,

In this neighbourhood, it is evident to common observation, that trees flourish, with unusual vigour, in the newly inclosed lands of arable fields; and that their injury to grass land is inconsiderable, when compared with the value of the timber they produce. The low spreading beads of the oak, and the leaves of the ash, appear to be the chief inconveniencies, of these two species of trees, to grass land,

But an alternacy of corn and grass is generally eligible, on lands which our ancestors have made choice of for common fields; and the roots of the ash are not only obstructions

to the plow, but the general nature of the plants is, in a fingular degree, inimical to corn.

It is, therefore, necessary to eradicate the ash from the hedgerows, before the land be again broken up for arable; or to preclude this tedious operation, in the first instance, by planting oak in its stead.

The HEAD of the OAK may be raised to such a height, as not to be injurious to grass, nor to the bedge while yet in a youthful state, even though it were suffered to run up to its natural height,

Whenever the inclosures are broken up for corn, the bedges ought, in common good management, to be headed, and kept in a dwarfish state; in which case TALL-STEM-MED OAKS would be a valuable source of TIMBER, without being, in almost any degree, injurious, either to the HEDGE, or to the CORN, growing under them.

But the TRAINING OF YOUNG OAKS, and the GENERAL MANAGEMENT OF HEDGE-ROW TIMBER, cannot, with any degree of prudence, be left to a mere occupier. Viewing hedges as nurferies of timber, a HEDGE-MAN becomes effentially necessary to every landed estate.

## WOODLANDS

AND

## PLANTATIONS.

I.

#### NATURAL WOODS.

THE VALLIES, which sever the lime, stone heights, on the north side of the Vale of Pickering, and give passage to the rivers and brooks, that take their rise in the morelands, it has been said, are mostly silled with wood. Formerly, it is probable, considerable plots of woodland were likewise scattered, at the seet of those heights; but, if there were, most of them are now done away: some few patches, however, remain.

On the fouthern banks of the Vale, too, are scattered some valuable tracts of wood-land.

The TIMBER of these woods is chiefly OAK, with a small proportion of ASH. BEECH, even upon the limestone heights, a situation to which it is peculiarly adapted, seldom if ever occurs, in natural woods: a degree of evidence, this, that the OAK and the ASH are natives, lineally descended from the ancient forests, which heretofore occupied these hills; and that the BEECH is not a native of this part of the kingdom. The limestone heights of Gloucestershire, Herefordshire, and South Wales, are hung on every side with BEECH, growing, to all appearances, in a state of nature.

The information which I have gained, respecting the woodlands of the District under survey, falls under the following heads;

1. Raising.

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2. Disposal.

5. Bark.

3. Felling.

6. Carriage.

I. RAISING. The practice of raising woods from Acorns, a practice which, formerly, has evidently prevailed, in different parts of the island, cannot easily be traced, in this. In some few instances, however, art may have been employed; but the generality of the old, well timbered woods, which were standing within the present century, but which

which now are nearly extinguished, have, it is highly probable, got up, fortuitously, from seedling plants rising in neglected roughets: a species of propagation, which is still observable, in almost every woody waste; and is, in truth, NATURE'S ONLY METHOD of propagating TIMBER OAKS.

An OAK, which springs from seed, in an open plain, throws out horizontal branches, on every side; and, being browzed upon by cattle, takes a shrub-like form. But oaklings, rising in a thicket, are secure from the bite of cattle, and are taught, by selfpreservation, to shoot upward, with a single stem; the sooner to gain the ascendency of the shrubs, which surround them.

This early babit of shooting upward, perhaps, afterward promotes an upward tendency. It is also probable, that plants, whose constitutions are naturally weak, are unable to cope with the difficulties which surround them; consequently, that those, which struggle through hardships so evidently great, are of an aspiring robust nature. Be this as it may, it is observable, that oaklings, which rise naturally in thickets, generally make tall vigorous trees.

But most of the woods, which at present remain.

remain, on this fide of the Vale, have been raised from stools of timber trees, formerly taken down.

This method of raising woods is called "fpringing" them; or, with greater propriety, RE-SPRINGING them: a practice which has long been prevalent, in this country; where coppice wood is of less value, than it is in most others,—fuel, bedging materials, and a few firkin boops being the only faleable articles.

When a wood is intended to be RESPRUNG, the timber is felled a few inches above ground, leaving the bark of the stools as entire as possible. d

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Before the young shoots make their appearance, the GROUND is, or ought to be, finally cleared, from the fallen timber and topwood, and the FENCES made up. If the timber, or topwood, be suffered to remain among the stools, until after they have made their first shoot, much mischief is necessarily done, in getting them off. And, if the young saplings be subjected to the bite of stock, especially in their infant state, the loss will not readily be retrieved.

Formerly, defending the timberlings from foreign enemies was the only care bestowed upon upon "young springs;" and this, perhaps, not very rigidly attended to. Now, the sences are pretty strictly kept up, and the plants, themselves, from time to time weeded, — provincially, "looked;" — that is, THINNED; the underwood and cross-growing timberlings being, in this operation, removed; to give air and room, to those which are more promising.

The business of WEEDING is generally deferred, until the weedling plants have acquired a degree of USEFULNESS; by which means the operation becomes doubly profitable.

The first thinning, I believe, is generally given, as soon as the undergrowth is large enough for STAKES, and the second, when it is long enough for RAILS; the former being given at about ten, the latter at about twenty years old. At every ten years, afterward, for half a century at least, posts as well as rails may, generally, be taken, with double advantage.

TIMBERLINGS, trained in this way, will reach, in a tolerable foil and a mild fituation, thirty to forty feet in height, and will meafure from twenty to thirty inches in circumference, in about forty years.

It is observable, that when a wood is intended to be sprung again, for timber, the entire ground is, or ought to be, cleared of every tree, great and small. Single trees,—standards,—provincially, "wavers,"—lest in a wood, under an idea of their being too young and thriving to be taken down, seldom retain a luxuriancy of growth, after the neighbouring trees are removed; but, by their drip and shade, do certain injury to the young saplings, rising round them.

It is also observable, that there is a great inequality of success, in raising timber in this way: while, in some instances, there will be a tenfold sufficiency of shoots to be trained; in others, too great vacancies will be sound. This may be owing to MANAGEMENT, or to the AGE of the timbers taken down. A young wood may be sprung, as fresh, with a degree of certainty. But, perhaps, there is danger, as well as difficulty, in regenerating an old one.

II. DISPOSAL. It has already been intimated, that the large feedling timbers, which formerly reared their heads in this District, are now nearly extirpated. There is, I believe, but one estate, and that not of considerable

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confiderable magnitude, upon which any large timber can now be found.

1. The AGE OF SELLING is, therefore, lower here, than in most other countries. There are instances of sapling woods being sold, at forty or sifty years old; and, when situated near a new Inclosure, are thought to pay better, at that age, than they would have done, had they been suffered to stand a longer time.

One fold, at forty years old, neated to the feller, about twenty pounds an acre. The foil a cold springy clay,—worth, in a state of ordinary improvement as arable land, seven or eight shillings an acre. But it would cost a considerable portion of its value, to change it from a state of woodland, to that state. Therefore, considering the cost of improvement, in one case, and the profit of the weedling plants and underwood in the other, it is much more eligible to keep this, or any wood similarly circumstanced, in its present state, or to improve it, to the utmost, as woodland, than to subject it to agricultural management.

Vol. I.

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<sup>\*</sup> See WEST OF ENGLAND, MINUTE 35, for Calculations on this subject.

2. The MODE OF DISPOSAL is to fell it, in the gross, flanding; by auction, or by private contract. The former, however, is, for the feller, the most eligible mode of sale; where men of property and character are bidders.

The buyers of timber are, generally, men of business; professionally versed in the value of wood; and able to make their own valuations, with sufficient accuracy; while the seller is obliged to rely on the abilities, and the integrity, of a third person; who, being uninterested in the sale, wants the main stimulus to rigid accuracy.

But, in a SALE BY AUCTION, with a sufficient number of bidders, the seller's valuation is of little consequence: the bargain, in this case, is transferred to the bidders: the contest is not between seller and buyer, but between bidder and bidder; both (or all) of whom being judges of the lot under sale, the seller has more than a fair chance of selling it, for its sull value.

3. The METHOD OF VALUING grown timber is to estimate every tree: not, however, by an exact admeasurement of each; but by taking the dimensions of a few, with sufficient accuracy. The valuer, having by this

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his means adjusted the eye, he depends aferward upon that alone; except now-andhen checking it, with the rod and line. If he trees be of moderate girt, the rod and ine are sometimes dispensed with, by men in great practice; who, with the arms only, an take the girt, and the ground length, with sufficient accuracy.

III. FELLING. The practice of repringing fallen woods being the established ractice of the country, that of felling timer trees a few inches above ground is uniterfally prevalent. Grubbing, or grubelling in the Norfolk manner, is seldom, if wer, practised.

The PEELING of oak timber is generally lone, by the day; the laborers being, I believe, invariably employed by the timber-nerchant, not by the tanner: practices which are productive of a confiderable faving if bark. Men, working by the ton or the quarter, or tanners, paying by weight or neasure, will not peel the boughs sufficiently near; it is against their interest to do it. But is the interest of the timber merchant, or if the tanner, if he purchase by the gross, or by the ton of timber, to peel, so long, as the nark will pay for the labor. This accounts

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for the smallness of the twigs, usually peeled in this country: if the bark run freely, twis not much thicker than the finger, are fre quently stripped.

The method of DRYING BARK, in the District, is generally the common one fetting it, in a leaning posture, against pole lying horizontally, on forked stakes. Bu in a wet scason, or when the ground is nate rally moift, it is laid across a line of topwoo formed into a kind of banklet, raising t bark about a foot from the ground. Byth practice, no part of the bark is suffered touch the ground: and it is, perhaps, upo the whole, the best practice, in all seaso and fituations.

IV. FALLEN TIMBER. For OA timber, the principal markets have, hithert been the ports of Whitby and Scarboroug But there is, now, very little ship timber le The feedling woods are few and fmall; a faplings, in general, standing thick upon t ground, perhaps three or four from a flo rise too straight, and are yet much too your for the purposes of ship building. It is fact, however, that at present (1787) spirit of ship building is so flat, that, scarce

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The medium PRICE of ship timber, devered at the ports, is 31. to three guineas, a on, of forty feet. But the price varies with he times, and still more according to the wality, that is the crookedness of the wood. Oak timber, sit for the purpose of the bouse-arpenter, may now be bought for sourteen ence, a foot.

Ash timber is chiefly worked up by the artwrights; and by coopers, into butter-irkins, and dairy utenfils. The price, one hilling to eighteenpence a foot, in the stick.

This similarity of price, between ash and ak timber, is owing to several causes: the resent want of demand for oak; the present carcity of ash; and to the circumstance of sh timber being, on the spot, at its principal market; whereas oak requires to be carried wenty miles, before it can be placed in a similar situation.

V. BARK. Oak bark is here fold to the tanner, ready prepared for his use. The timber merchant not only dries it in the wood, but stacks or houses it; and generally shaves and chops it, ready for the tanpit; selling it to the tanner, at so much a quarter.

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This custom appears to be founded on a false basis: the tanner is, or ought to be, the best judge of the mode of preparation, and the operation ought to pass under his eye.

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The practice of grinding bark does not feem to have yet got footing, in the District: whenever it does, it will of course bring the preparation of bark into its proper channel.

The medium price of chapt bark, is 10s.6d.

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VI. CARRIAGE OF TIMBER. The carriage of timber has long been a distinct employment, in this part of the District. The price for twenty miles, the nearest distance, is about 15s. a ton, of forty seet; for forty miles, the longest distance, 30s. has been given:—this is, in both cases, ninepence, a ton, a mile.

Supposing the price of eak timber, at the ports, to be three pounds, a ton; and that it lies at the western extremity of the Vale; the carriage reduces the price, in the place of growth, to 30s. a ton; which is one half of the price at market. But timber, which grows only twenty miles from the ports, is reduced in price, by carriage, only one fourth of its market price; and that grown, with-

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These circumstances show, in a striking manner, the advantage of propagating timber, in the neighbourhood of ship yards; and point out the impropriety of raising it, at a distance from water carriage; or some established inland market.

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# PLANTATIONS.

THE SPIRIT OF PLANTING can fearcely be faid to have gained a footing in the District under survey.

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Of late years, the passion of taking down has been much stronger, than that of raising

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\* Some years ago, the price of ordinary ash timber, at Scarborough, was 11d. a foot. There was an instance of a parcel being carried, somewhat more than twenty miles (the inland market being of course overstocked) at the rate of 5d. a foot, for carriage. This reduced the price to 6d. a foot, in the place of its growth. Had such ash timber been carried, at those prices, from the extremity of the Vale, it would have neated only 2d. a foot.

up. Indeed, in some parts of it, the NATURAL WOODLANDS, which abound, render PLANTATIONS the less necessary.

But upon the wolds, and other beights adjacent to the Vale, SHELTER PLANTATIONS are every where wanted; and it must be a matter of assonishment, to every one who gives it a moment's resection, that the spirit of planting should, in these situations, have lain dormant so long.

Upon the WOLDS, however, it has at length risen into action. Sir GEO. STRICKLAND has scattered a number of sheltering clumps, upon the heights, towards Malton; and STR CHRISTOPHER SYKES and others are placing skreen plantations, upon the bleak swells of the higher Wolds. Should this laudable spirit diffuse itself into a general practice, not only the face of this sine passage of country, but the very soil, or at least its produce and value, will in a short time be changed.

The skreen plantations, which I have obferved upon the Wolds, are all of the MIS-CELLANEOUS kind;—pines and deciduous trees of various forts, mixt together.

It strikes me, however, that the BEECH, alone, would be the most eligible tree to be propagated upon the Wolds; it is peculiarly adapted

adapted to calcareous soils; and thrives with singular vigour in exposed situations. Upon the chalky hills of Surrey and Kent, it is the prevailing timber tree. Upon the hills about Amersham in Buckinghamshire, too, a chalky soil, the beech thrives with uncommon beauty and luxuriance: and its wood seems to be growing daily into estimation.

Sowing the masts, in drills, and cultivating the intervals, is perhaps the most eligible method of propagating thist ree, for the purpose here mentioned.

In the VALE, the almost only plantations, which have been made with a view to utility, are small clumps of Scotch fir, planted for the purpose of giving shelter, and shade, to pasturing stock.

There is one instance, however, in which a more regular plan of improvement has been chalked out, and executed.

This instance of improvement, having been prosecuted with judgment and perseverance, and by one from whom I have received more useful ideas, in planting, than from any other man I have conversed with, is noticeable.

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The fite of improvement was a low moory fwamp, lying barely above the level of a rivulet, running by the fide of it. The fubfoil a blue clay: the topfoil, a black peat earth, of an irregular depth; varying from a foot to three or four feet deep. The turf, a mat of rushes, sedges, and other palustrian weeds, equally unpalatable and unproductive, either of hay or pasturage; some parts of it being dangerous to stock. The form triangular: the area, containing nine or ten acres, an entire flat; except a gentle descent towards the longest corner. The fituation, though low, extremely chilling, being exposed, on every fide, in a naked watery over to a committee for an or plain.

The IMPROVEMENTS, obviously requisite in this case, were warmth, and a proper de-

gree of dryness.

To obtain these, the rivulet and the surrounding ditches were deepened; and a deep counter ditch, main drain, or shore, sunk at a distance from the boundary sence; leaving an irregular border, of sive to ten yards wide, entirely round the area of the site of improvement; which, by this simple operation, alone, was removed sufficiently out of the water's way; except at the lowest extremity,

mity, where the main drain had its outlet into the rivulet.

The BORDER, too, by the same operation, was laid sufficiently dry, for the purpose of PLANTING.

The lowest extremity, and the moister part of the margin next the rivulet, were planted with AQUATICS; the drier parts with FOREST TREES of various species.

It is now fourteen or fifteen years, fince this improvement was first set about. The border of planting begins already to have, at some distance, the effect of an entire plantation of equal circuit; while the area, within, enjoys all the advantages which shelter can give it.

What remains to be faid, here, respecting the effect of the improvement under detail, is to mention the present state of growth, and the comparative progress, of the different species of forest trees, uponadrained moory soil \*.

It is an opinion of the improver of this plot of ground, that a DRAINED MOOR is the drieft of foils: an opinion founded on his own experience, The summers of Eighty-

<sup>\*</sup> The further improvement of the area will be mentioned in its proper place.

five and Eightysix were very dry; the plantation made little progress, and the area was unproductive. This year (1787) the summer has been moist;—the trees and the grass are equally luxuriant.

Moory soil, when perfectly dry, repels water like a dry spunge; but, like this, when once it is saturated with moisture, it retains it longer, than common earth does. But a moor, effectually drained, and placed above the level of collected moisture, is not readily filled with water; it may therefore be justly ranked among the driest soils.

This accounts for the rapid progress which the BIRCH and the SCOTCH FIR (both of them mountain plants) have made in these plantations. In the drier parts, they are more than twenty feet high; far outstripping every other species; except

The Norway spruce, which, for the first ten or twelve years, at least, thrives vigorously. But some plants of this species, planted sourteen or sisteen years ago, are getting ragged, and appear to be in an unthriving state. But whether this be owing to the severity of the late winters, or whether the roots, being now crampt for room, have got down to the uncultivated moor, or

the cold barren clay which lies under it, is uncertain.

The AMERICAN SPRUCE, too, the PINE-ASTER, the LARCH, and the VIRGINIA CEDAR, thrive abundantly, in this foil and fituation; but none of these have been planted more than seven or eight years.

The ASH and the BROAD-LEAVED ELM also make a promising appearance; but the OAKS, though they look healthy, do not shoot upward \*.

On the moister parts, the ALDER takes the lead. But the ASH, the ASP, the POPLAR, and the OSIER, grow with sufficient luxuriance, to shew, that their situation is perfectly agreeable to them.

A patch of OZIERS were kept down, experimentally, as an OZIER BED. The growth was luxuriant; and the profit, the second to the fifth year, ample; the produce, at least,

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\* This, however, is thought to be owing more to late SPRING FROSTS, than to the nature of the soil. Silver first have done worse than the oaks; but shoots, several inches in length, have been evidently observed to be nipped off, by summer frosts; which, it is observable, are much stronger in low than in high situations; owing, perhaps, to the greater quantity of moisture in the air: This, at least, accounts for the extraordinary quantity of boar, collected in low situations.

five pounds, an acre, yearly: but the plants beginning to decline, and an ozier ground not being calculated to give the required shelter, the experiment was not pursued.

GEN. OBS. Upon the whole, it appears to me evident, that the OSIER, the ASH, and the BIRCH are the most eligible species to be planted on a DRAINED MOOR; keeping them in a state of COPPICE WOOD, and felling the inner and outer edges of the border, alternately: the first fall for stakes; the second and succeeding falls for rails.

By this means a PERPETUAL SHELTER would be secured.

A few Scotch firs, planted at proper distances upon the margins, and kept pruned on the inner sides, would add a degree of ORNAMENT, without being destructive of UTILITY.

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# FARMS: Horosoporpai so

THE SIZES OF FARMS vary, in different parts of the District. On the Wolds, they are principally large; in the VALE and the MORELANDS, extremely small.

Considering the VALE, distinctly, more than half of its lands are laid out, in farms, under twenty pounds, ayear. Perhaps, three fourths of the Vale, and the lands belonging to it, lie in farms, of less than fifty pounds, ayear.

In the west marshes, and in the RICHER PARTS OF THE VALE, low moist situations, inhabitants are thinner, and farms larger.

But viewing the Vale, collectively, there is not, perhaps, in this kingdom, another District of equal extent, and of which

which contains so great a number of farms, or rather parcels of land in distinct occupation; many of them being occupied, not by TENANTS, but by OWNERS \*.

The advocates for SMALL FARMS will conceive, that a District thus laid out must necessarily excel in husbandry; and that the superiority of management must, of course, be in proportion to their degree of smallness.

On the contrary, however, no country, perhaps, affords stronger evidence of the fallacy of those conceptions. A mixture of good and bad management is evident, in every quarter of it; and it is on the LARGER, not on the smaller farms, we find a SPIRIT OF IMPROVEMENT, and a SUPERIORITY OF MANAGEMENT prevail.

Poverty and ignorance are the ordinary inhabitants of small farms: even the smaller estates of the yeomanry are notorious for bad management.

It is on the larger estates of yeomanry, and on the larger farms of tenants, we must look for the best practice of the District.

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<sup>\*</sup> When this was written, the WEST OF ENGLAND had not paffed under my observation. (1796.)

It is not meant, that a regular gradation of management can be traced, by the magnitude of farms: many exceptions might be pointed out. Nor does it follow, from the evidence of this District, that very large farms are conducive to good management. occupier of eight hundred or one thousand pounds, ayear, is too fully employed, with the OUTLINES of management, to attend fufficiently to MINUTIZE, much less to conceive and execute useful IMPROVEMENTS. His best management is to press forward, in the beaten track of the country he farms in; depending upon the ampleness of his business, to make up the deficiencies, arifing from the unavoidable neglect of minutial matters.

The CHARACTERISTIC OF FARMS, in the Vale, is GRASS, with a smaller proportion of arable land.

Formerly, the area of the Vale was principally grass, and the margins open arable fields. Now, the latter is inclosed, and principally applied to the use of the dairy; while the former is much of it subjected to arable management.

Upon the whole, although the admixture of ARABLE be confiderable, the Vale, in a general point of view, comes under the denomination of A GRASSLAND COUNTRY.

Vol. I. R FARMERS.

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#### FARMERS.

FROM WHAT has been faid, in the last section on FARMS, a general idea of the FARMERS of the Vale may be gathered.

Among the lower class of tenants, little information can be expected, and still less from the inferior yeomanry, whose scanty possessions are too frequently marked, with an inferiority of management.

It is from the SUPERIOR CLASS OF YEOMAN-RY, and from fome few PRINCIPAL TE-NANTS, we must expect to learn the best practice of the country. It is on the farms of men, whose independency, conversation, and perhaps reading, has led them to think, and act, without prejudice, we must expect to find a superiority of general management, and a spirit of improvement prevail.

It has long been observed in the ECONOMY OF NATIONS, that where liberty is established there commerce and the arts flourish. And

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it is equally observable, in RURAL ECONOMY, that where independency resides, there Agriculture improves. A monied man, cultivating his own estate, enjoys the highest degree of independency; a lease tenant the next; tenants at will the lowest.

It has already been intimated, that, in this District, tenants at will (some very sew perhaps excepted) have lost all considence, and consequently have lost even their ideal independency. They dare not improve lest some advantage should be taken of their improvements. It has also been said that leases are, yet, but little in use.

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Therefore, among the YEOMANRY, alone, we must look for that degree of independency, which is essentially necessary to improvements in Agriculture.

No country, of equal extent, can boast of so numerous a body of yeomanry, as the Vale under survey; nor any country, I will venture to affirm, where industry and frugality are more conspicuous; or where a personal independency is more strongly rooted, among men in middle life.

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### WORKMEN.

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THE YEARLY SERVANTS of this District are noticeable, for the highness of their wages, and the lowness of their living, and for the length of their working hours.

The wages, of an able man servant, are twelve to fifteen pounds, ayear. During the late war, fifteen to eighteen pounds were given!

But the simplicity of their DIET more than compensates for the extraordinary height of their wages. Milk still remains, here, a food of farmers' servants. In some places, animal food, three times a day, is expected; here, once a day (except perhaps in haytime and harvest) is considered as sufficient.

In MALT LIQUOR, too, the farm servants of this country are equally moderate.

Nevertheless, if one may judge from their appearance, and from the quantity of labor they dispatch, their mode of living is conducive to HEALTH.

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The TIME OF CHANGING SERVANTS, which prevails through this country, is Martinmas (Nov. 22.) \*. The conveniency of this time of changing fervants, and the inconveniency of changing at Michaelmas, have been pointed out on a former occasion †.

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#### BEASTS OF LABOR.

THE LONG AGITATED dispute, about the superiority of OXEN OF HORSES, as beasts of draught, may here be considered with singular propriety. But, I am asraid, even this country will not surnish sufficient evidence, for a final decision.

Formerly, and from time immemorial, four or fix oxen, in yokes, led by two horses, also double, were the invariable "draught"

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<sup>\*</sup> Except in CLEVELAND, where Mayday is a more general time of changing.

<sup>†</sup> See MINUTES OF AGRICULTURE—Dates 10 and 12 OCTOBER 1775.

or team of the country; not only upon the road, but in plowing. Even in stirring a fallow, four exen and two horses were generally considered as requisite. And, in breaking up a fallow, two men and a boy were the common attendants, of this unwieldy expensive team.

At present, there is not, perhaps, throughout the Vale, a single ox employed in tillage: two horses, with whip reins, without a driver, is now the universal plow team for all soils,

in almost every state.

Upon the road, however—that is to fay, in farm carriages—oxen are still in use; but seldom more than a single pair to a carriage; —generally at the pole, with two or three horses, at length, before them. Besides, a number of entire horse teams, now, travel upon the roads; things which, formerly, were unknown in the country.

On a general view, and in the opinion of men whose age entitles them to be judges of the subject, there is not kept, at present, onefourth of the working oxen, which formerly

were employed, in the Vale,

Shall we hence argue, that because exen have declined, they are ineligible as beasts of draught? It might be unfair to do it.

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There are two evident causes of the decline of oxen, in this country.

Formerly, there was not only much more land in tillage, but the plow of those days was a heavy ill shapen implement, requiring at least one pair of oxen extraordinary to draw it; yet, unwieldy as it was, the quantity of land, then in tillage, required that it should be worked, in all seasons. At prefent, the plow in use is admirably constructed;-light, and well formed for passing through the foil. With this plow, and with the land in season, it is found, that the two horses alone, without the oxen, are sufficient for the purpose of tillage. This, in a country where the breeding of horses had long been an established practice, was a sufficient cause of the disuse of oxen in plowing.

Their decline upon the road is, in part, owing to the same cause. Four horses make two plow teams, and, occasionally, a road team. This accounts, in some measure, for the increase of horse teams, upon the road; but it is not the only cause of their increase. When oxen were in common use, the roads lay in their natural stat state; deep in winter, and soft to the hoof in summer: now, they are universally a rough causeway of lime-

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stones,

stones, in all seasons unfriendly to the feet of oxen. Even shoeing is found ineffectual, when they go constantly upon the road.

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Under this change of circumstances, it is no wonder that the use of oxen should have declined. On the contrary, it appears to me a matter of surprise, that so great a number should still be employed; a circumstance which, in my mind, evinces their utility as beasts of draught.

Even the timber carriers (an industrious and wary set of men) continue to use them; though their sole employment be upon the road. They not only find them able to stand working, every day, provided their seet do not fail them; but, what is much in their savor, they are sound to stand long hours, better than horses going in the same pasture. An ox, in a good pasture, soon fills his belly, and lays himself down to rest; whereas a short summer's night scarcely affords a horse time enough to satisfy his hunger.

Another advantage of oxen is, here, held out. In stiff pulis of every kind, most especially in going up steep hills, a pair of oxen are considered as a sheet anchor. Horses, it is argued, are fearful, and soon lose their seet, in a steep slippery road; while oxen, where

where they are unable to proceed, will fland their ground. Indeed, oxen feem to be confidered as effentially necessary, in an aukward hilly country.

This idea, in a country where half bred hunters are the principal horses used in draught, is no doubt well founded; but where thorough bred cart horses are in use, it loses much of its weight.

But what are thorough bred cart horses? Why, a species of strong, heavy, sluggish animals, adapted solely to the purpose of draught; and, according to the present law of the country, cannot, without an annual expence which no one bestows upon them, be used for any other purpose.

This species of beasts of draught cost, at four years old, from twenty to thirty pounds; will, with extravagant keep, extraordinary care and attendance, and much good luck, continue to labor eight or ten years; and may, then, generally be sold for five shillings, a head.

If we had no other species of animals, adapted to the purpose of draught, in the island, nor any one which could be naturalized to the climate, cart horses would be truly valuable; they being much superior

to the breed of faddle horses, for the purpose of draught.

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But it appears to me evident, from the experience I have had, and the observations I have made, that were only a small share of the attention paid to the BREEDING of draught oxen, which now is bestowed on the breeding of cart horses; animals equally powerful; more active; less costly; equally adapted to the purposes of HUSBANDRY, (if harnessed with equal judgment); less expensive in keep and attendance; much more durable; and infinitely more valuable after they have finished their labors—might be produced \*.

Oxen, here, are all worked in yokes, and always led, by one or more horses. They are usually broke in, at two or three years old; and worked, until they be rising six; when

\* I do not mean to intimate, that any breed of oxen would be equally fit as horses, for the road only: I have had no experience of either of them, in this kind of employment; which is foreign to the present subject: let carriers and draymen make their own election. All I contend for is, that, were a proper attention paid to BREED, oxen, and spayed heisers, equally as fit for the purposes of tillage, the carriage of manure, hay, corn, and suel, and for every other purpose of DRAUGHT, in the ordinary business of HUSBANDRY, as the heavy cart horses at present in use, might be obtained.

when they are bought up, for the Midland, or South country graziers.

Considering oxen as rearing cattle, which are worked occasionally during the years of growth, this plan of management is eligible enough; but viewing them, abstractedly, as beasts of draught, that mode of treatment is very injudicious: they are worked while they are feeble for want of age, aukward for want of experience, and thick winded through a fullness of growth; and thrown up so soon as they have learnt to know their duty, and are become able to stand work.

A steer, like a colt, ought to be familiarized to harness, at two or three years old; but should never be subjected to hard labor until he be five years old: from which age, until he be fifteen or perhaps twenty, he may be considered as in his prime, as a beast of draught. An ox which I worked several years in Surrey, might, at seventeen or eighteen years old, have challenged, for strength, agility and sagacity, the best bred cart horse in the kingdom.

The species of ox, worked in this District, will appear under the head BREED OF CATTLE.

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### IMPLEMENTS.

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THE Implements of the Vale, which require to be noticed, are,

1. Waggons.

fledge.

2. Plows.

4. Molding fledges.

3. The common 5. Machine fans.

I. WAGGONS. The waggons, and other wheel carriages of the Vale are, in general, confiderably below the middle fize.-A full fized waggon does not measure more than forty cubical feet: the ox cart-provincially " coop"—about twentyfour feet.

Their construction, though in many respects fingular, is passed over, as being in nowise peculiarly excellent \*. But they have a defect o easi while same or which

\* Excepting in two petty improvements, which I have have not observed elsewhere. The one is a simple improvement of the WHEEL-WASHER-provincially "Runner"-which frequently flicking in the end of the nave, wears off the ends of the linch-pin; thereby lofing its principal intention. The improvement is made by placing a knob, on the outer surface of the Washer; which, catching the wh pec cor car

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pre DO the which requires particular notice; as it is not peculiar to the Yorkshire waggon; but is common, in a greater or less degree, to the carriages of other Districts.

The Turnpike-road Act, made in the thirteenth year of the present reign, orders, "that no pair of such wheels (common three inch wheels) passing on turnpike roads, being above twenty miles from London, shall be wider than four feet six inches, from inside to inside, to be measured on the ground;" (that is, four feet nine inches from middle to middle of the ruts) "under the penalty of sive pounds!"

The waggons of the Midland counties (the fize of them extraordinary large) run the width of five feet two or three inches, from middle to middle of the rut. Those of Gloucestershire (of the middle fize) run four feet nine inches wide: those of the Vale of Pickering only four feet three inches.

All

the end of the linch-pin, prevents its turning round with the wheel; by which means the entire friction is, as it ought to be, between the Washer and the end of the box of the nave. Accidents frequently happen, for want of this precaution. The other improvement is a FALLING. DOOR, in the bottom of the fore part of the waggon; for the more easy delivery of lime, coals, and other body loads.

All these widths are much too small for the respective sizes of the carriages: and how the framers of the Bill, above mentioned, could impose a restriction, evidently tending to destroy the roads, they were endeavouring to preserve, is a matter of some surprize.

In the article Roads, page 172, the effects of carriages, passing upon shelving roads (of the nature of which every barrelled turnpike road more or less partakes) have been mentioned. The damage will always be, in proportion to the inclination of the road, to the height of the load, and to the narrowness of the span of the wheels, considered jointly.

The center of gravity of the load (including the carriage), and the two points of the peripheries of the wheels (of a two-wheeled carriage), which are in contact with the road, form a triangle. The extremity of damage is when the load is in the equipoise of overturning; the entire weight of the load and carriage resting, at that time, upon one wheel; which, in that case, injures the road as much as a load, of much greater weight, would, in passing upon a level road. Whenever either side of the triangle, above described, is brought into a perpendicular position, the load is in the injurious equilibrium.

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These premises being duly considered, it is obvious, that there are three ways of reducing the perpendicularity of the line; confequently, of preventing a loaded carriage from being placed in fo destructive and dangerous a state. First, by raising the depreffed corner of the triangle; that is, by bringing the road nearer to a level: second, by shortening the sides of the triangle; that is, by lowering the center of gravity of the load; or, in other words, reducing the height of the carriage: third, by lengthening the base of the triangle; that is, by widening the fpan, or placing the wheels farther afunder. These things are mathematically demonstrable; but as they must appear obvious, to every one, acquainted with the rudiments of fcience, it would be wrong to load the present volume, with a more minute explanation.

But the injury of the roads is only one part of the mischief, arising from the wheels of carriages, running too narrow. The increase of draught (see Roads, p. 173.), the extraordinary stress and wear of the carriage, and the evil effects of overturning,—are matters of still more importance, to farmers, and other proprietors of carriages.

It would, perhaps, be in vain to conjecture ture the means, through which the present widths of the span of carriages have been established, in different countries; each of which has its particular width; otherwise, the difficulty of passing in rutty by roads would be greatly increased.

In the present state of husbandry and landcarriage, and the present state of roads, it appears to me evident, that GATEWAYS, alone, ought to prescribe bounds to the width of carriages.

Farm gateways measure from eight feet and a half to ten feet wide. I know no extraordinary inconveniency arising from a gateway of the latter width; and through such a gateway there would be no difficulty in conducting a carriage, with dished wheels, running five feet or even six feet wide. Five feet and a half would, perhaps, be found the best legal width.

This increase of width would operate, in a variety of ways, to the advantage of land-carriage. Roads would be less injured; team-labor would be facilitated; carriages would last longer; and loads would be less exposed to danger, than at present.

Nor would these be the only advantages; the increased distance, between the wheels, would the this of the add by

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would admit of a proportional increase in the width of the body of the carriage; and this of a proportional reduction of the height of the load. Advantages, these, besides the additional strength which the carriage would by this means receive, which appear to me too obvious to require further argument.

II. PLOW. The plow, at present in universal estimation in the Vale, is of the light, short, winding-moldboard fort, which, in different parts of the kingdom, goes under the name of the Dutch plow, or the Yorkshire plow.

On the construction of a ship, volumes have been written, without any universally received principles being yet established. The Bermudians, who build by the eye alone, without either drawing or gauge to affift them, excel all other nations, in the construction of small vessels (the almost only produce of their islands); which are remarkable as fast failers, and notorious for lying nearer the wind, than other veffels.

Different as the ship and the plow may be, in magnitude and general appearance, there is fome fimilarity, in the principles of their construction; and the difficulty of fixing those principles, and of reducing them to a regular theory.

Vot. I.

theory, is nearly the same in both ha The art of construction, in either case, is principally attained by practice: a land require day a lo side

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In this District, the species of plow under notice is, in general, constructed better than it is, perhaps, in any other; yet, even here, the plows of different makers pass through the soil, with various degrees of facility and execution: nevertheless, though I have paid some attention to the different makes, I find myself unable to detail the minutize of construction. Even the general principles I must mention with diffidence.

The great difficulty, in the construction of a plow, is that of adapting it to all foils, in all seasons, and to all depths, at calculating is

If the soil break up in whole farrow, every inch of depth requires, in strictness, a separate plow, or a separate regulation. Here rests the great objection to the WINDING MOLDBOARD, which admits of no regulation in respect of depth.

of the moldboard, be raifed sufficiently high, to turn a thick surrow completely, it is of little use, in turning a thin one. On the contrary, if it be brought down sufficiently low, to turn a shallow surrow properly, it is impossible

possible to turn a deep one with it, in a works manlike manner! There is not room for it within the hollow or femi-archway of the moldboard. The inevitable effect of this is, either the furrow is forged away, wholly; by the upper part of the moldboard, and fet on edge; or the moldboard rides upon the plit, raising the heel of the plaw from the bottom of the furrow; especially in plowing fward, or other whole ground un an A Ha An UPRIGHT STERN with a movemble HEBLPHATE \* to turn the furrow at any given depth, is, in this point of view, much preferable to a hollow moldboard; and if its use, in raising a crest of mold, for the purt pose of covering the feed, he added, its preference is still more conspicuous; and I fee no reason why the Yorkshire plow should not

The FOREPARTS of a Yorkshire plow, of the best construction, are admirably adapted to infinuate themselves beneath the soil, and to raise the plowslice: a better form, perhaps, cannot be contrived.

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mble receive fo valuable an improvement.

But the plows, even of this neighbourhood, are far from being uniformly excellent, in

See Minutes in Surrey:

that respect. The NECK is frequently too thick and the BOSOM too hollow: the former creates an unnecessary friction; and the latter forms a receptacle for loofe mold to lodge in; and both of them are detrimental to the turning of the plit. The bosom may be made too full, but the neck cannot, well, be made too fine, on the off or outer edge.

The righthand fide of the focket of the SHARE ought to be brought down to a share angle, or rather to an edge; the under-fide being made flat, and as level as may be, with the under furface or foal of the plow. The part which is folded back, to lay hold of the bottom of the woodwork, too frequently forms a foul protuberance, on the foal; rendering the plow unfleady, -increasing the friction unnecessarily, - and, by raising up the fin of the share, preventing it from acting properly.

The form of the Yorkshire plow is not its only excellency: the ordinary PRICE of the wood work complete, is not more than feven shillings and fixpence! the iron work about twenty shillings, including plates for the landfide and moldboard. Caft iron plates, somewhat resembling those of the Norfolk plow, are now coming into use, instead of

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wooden moldboards. Those will reduce the general price still lower.

III. THE COMMON SLEDGE. This petty implement will be confidered as unworthy of notice, by those who are unacquainted with the uses of it. Nevertheless, here, where it is in common use, it is in universal estimation.

For carrying harrows and other implements,—thorns and other rough wood,—turneps when the ground is tender, &cc. &cc. a fledge is, frequently, much preferable to a cart or a waggon. Some are made small and light, for one horse; others strong and large, to be drawn by a team of oxen or horses.

The principal fingularity of construction consists in a valuable addition, to the common harrow sledge of other countries. This addition is made with two cross pieces (like the cross pieces of a eart or waggon), one fixed upon each end of the body of the sledge, projecting without the side pieces, about ten or twelve inches, at each end. Upon the extremities of these cross pieces are fixed two rails,—provincially, "shelvings,"—one on each side; thus increasing the width and hollowness of the bed of the sledge, and S 3 thereby

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thereby rendering it capable of carrying a larger load with greater steadiness.

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plement, I apprehend, is peculiar to York-thire, an only about the control of the

of meadows; at the same time spreading the dung and molehills.

of the common fledge, without its fide rails and cross pieces; the upper edges of the fide pieces (of the body of the fledge) being, for this purpose, made perfectly straight.

In use, it is drawn with the face downward, and the side foremost, across the ridges.

LANDELANE, described in the MINUTES OF AGRICULTURE; which, having a middle bar, levels the surface; whereas this, having no middle bar, only smooths it.

The FRONT BAR (namely, the fide which is drawn foremost) forces off wormcasts, the rudiments of anthills, and other protuberances of the surface; also collects the dung of cattle and horses, the molehills, and other loose incumbrances, which lie in its way.

This collection of materials being driven before the implement, grind each other down, fine

fine enough to lodge in the dimples and fiffures of the fward; thus smoothing the surface in a twofold way; and, at the same time, mixing, reducing, and distributing the meliorating ingredients, in the most effectual manner.

The FRONT BAR is sometimes shod, with iron, projecting, with a hoe-like edge, before the wood work. But this is unnecessary; and is frequently injurious, in defacing the sward. The wood work itself, while the acting angle in front remains sharp, is perhaps the best: but the angle soon wears off; by which means the implement loses its effect, in removing the more stubborn protuberances. An iron bar fixed, not beneath, but in the front of the wood work, the lower edge being set slush with the sace of the implement, acts in a similar way to the wood itself, without being so liable, as this, to be worn away.

The use of the HIND BAR is to give firmness to the implement, and to finish what the front bar may, by accident, have lest incompleat; the manner of acting being in both of them the same.

The length or width of this implement is usually fix to eight feet. The breadth, or dimension from out-to-out of the front and

hind pieces, four to five feet. The depth of these pieces six to eight inches: their thickness about three inches.

Additional weight, if required, is given by logs, stones, or other heavy materials, laid upon the cross bars which bind the two acting pieces together. In places where a particular exertion is requisite, the driver will add his own weight, by stepping upon the implement, and remaining upon it, until the occasion be passed.

V. WINNOWING MACHINE. This excellent machine is too well known, as a curiofity, in most parts of the kingdom, to require, in this place, a general description \*. But the county under observation being the only one in which its use has been established, in common bractice, it merits, in this place, particular notice.

We are probably indebted to the Chinese, or other eastern nation, for the invention of this machine, I have seen it upon an India paper, drawn with sufficient accuracy to shew, that the draughtsman was intimately acquainted

The late Mr. Sharp of London made it several years.
Winlaw of Margaret street, Cavendish square, still makes
it.

ed with its uses. The Dutch, to whom the invention has been ascribed, imported it, in all probability, from the East Indies. Let this be as it may, it indisputably came from Holland, into this country.

Its first introduction, into the Vale, was by a gentleman of this neighbourhood, about thirtysive years ago. But the introducer committing this complex machine to the care of servants, without paying attention to it himself, it was, as might be expected, soon thrown aside, as useless.

Some time afterwards, however, it fell into the hands of a fenfible fubstantial yeoman; who, with the assistance of a friend, discovered its usefulness, and reduced it to practice.

My father, who had made himself master of the excellencies and desects of this pattern, made one from it, with some improvements. This was the first which was made in the District, and perhaps the first which was made in England.

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The utility of these being seen, by some discerning individuals, several others were constructed, under my father's direction. But, notwithstanding many of them were kept in common use, and visited as subjects of ad-

miration,

miration, it was fome fifteen or twenty years before they grew into popular estimation. Within the last ten or fifteen years, the making of them has been an ordinary employment of wrights and carpenters. At present, there is fearcely any man, whose farming is confiderable, without a ... Machine Fan " and, among the smaller occupiers, it is not uncommon for two or more to join, in the purchase and use of one of them.

The construction of this machine has undergone several alterations, and some few improvements may have been made in it; none of them, however, of moment; except that of changing the materials of the fails, from boards to theet iron! Its com plexness is the only bar to its popularity. Should a happy simplification of it be hit upon, it will doubtless be received into unit versal practice. This was the first which was

The prefent price is about five guineas.

Its uses will be spoken of, under BARN Caburda yallan al F MANAGEMENT.

coming Individuals, toy thursted, under my rather's direction. But, nowishflunding many of them were kept in continued title, and vanier as indicate of ad-.nonsmiri

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and accuracy; it is beyond the power of incebanism to form to fine a balance,

To the improper tables of the Jews, and ether makers (who enght to have judged better), we must afribe those disappointments whinaHTAAW affinitrument into undeferved disrepute. If instead of further,

THE BAROMETER, here, as in other places, has its advocates and its revilers. But neither of them appear to view it in its true light. The former speak well of it, because it has more than once saved their hay or their corn from damage; the latter revile, or perhaps break it, because they have been caught in the rain, when the weather-glass was above changeable; expecting that the glass should indicate the weather, with the same precision, that a clock or a watch shows the time of the day.

But this is somewhat unreasonable: it would, indeed, be equally philosophical to quarrel with the scales, when the guinea is under weight. It is quarrelling with the laws of nature, not with a glass tube and quickfilver.

All that the barometer pretends to is, to ascertain the WEIGHT OF THE ATMO-SPHERE; which it does with great delicacy and and accuracy: it is beyond the power of mechanism to form so fine a balance.

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To the improper tables of the Jews, and other makers (who ought to have judged better), we must ascribe those disappointments which have brought their instrument into undeserved disrepute. If instead of fair, rain, and changeable, they had substituted beavy, light, and medium, or merely a scale of degrees, the barometer would have been considered, what it really is, a balance for ascertaining the weight of the atmosphere; not, what it never was or can be, in itself, an infallible prognosticator of the weather.

In a former work \*, I digested my ideas on this subject, fully, and circumspectly. It is now more than seven years since that work was written; during which period I have continued to pay, in the summer months of almost every year, strict attention to the weather. My success has been almost uniform; much beyond any thing my expectation could have suggested.

My THEORY and PRACTICE still remain unchanged. The SETTING SUN and the

<sup>\*</sup> Experiments and Observations concerning Agriculture and the Whather.

BAROMETER, taken jointly, not feparately, have been my chief dependance: other AP-PEARANCES, the WIND, and the HEAT of the atmosphere have, in doubtful cases, lent their affistance.

What I mean to say further on the subject, at present, is, to recommend to every man, concerned in matters of husbandry, to pay due attention to the weather. I know from my own experience (even though I may have been in some degree fortunate), that much may be saved by it.

He must not, however, expect that a foreknowledge of the weather is readily learnt: like holding the plow, and judging the quality of stock, it requires considerable PRAC-TICE.

In haytime and harvest, let him give an eye to atmospherical appearances, and attend to the setting sun, as a business of the first importance; and let him consider his barometer, as a useful implement of busbandry.

In the course of a few summers, he will find himself enabled to foresee the weather, with the same kind of PRACTICAL KNOW-LEDGE, as that which tells him what hay is fit for the stack, and which bullock will pay best for grazing.

Pickeing, Yorkshire of the your nood own!

The großberry foliated, - to March.

to The fallow in full blow, -- 5 April and and

One swallow, near water,—12 April,

"Swallows about houses,—27 April 1979

ou Cuckow first heard, 6 May ni bantones

nvSwifts, 12 May! Tollerwanten nomen

ni Oak foliated, -29 May. neve) geneifagee

ed Hawthorn blowed, to Junes garget and

Ash foliated,-11 June.

During May, cold pinching winds; and, in the beginning of June, a very smart frost.

QUERY, Do these circumstances account for the unusual difference in the time of foliation of the oak and the ash, and the blowing of the hawthorn; which, in a common year, happen within a few days of each other? The roots of the oak lie low; those of the ash and hawthorn, superficially.

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In June, heavy rains set in; and continued, almost without intermission, until December. So wet a summer has seldom—perhaps searcely ever—happened. Hay, in general, was spoilt; and thousands of acres of corn were little less than wasted in the field a circumstance, perhaps, entirely new in the annals

annals of husbandry. I never before knew a feason, which did not afford a time (to those who had patience to wait for it,) for harvesting hay and corn, in tolerable condition. But this year, the late-ripe crops upon the Wolds, the Northern Heights, and in the Morelands, were, inevitably, little less than lost. During the latter harvest there were not, I believe, two fair days together, until near Christmas! the corn, which was carried, was of course spoilt, in the stack or mow. Hogs were bought up, and turned loose among the sheaves in the field!\*

Another remarkable circumstance of this season was the extraordinary STRENGTH OF VEGETATION; which was equally manifest in the garden and the field. Every thing was out of fize: Some plants entirely disfigured. Pasture grounds overrun with stale grass. In some stinted pastures (grounds let out annually in cowgaits to a fixt number of cows) scarcely half the grass was eaten.

These extraordinary exertions of vegetation are, perhaps, to be accounted for, in a succession of dry summers, terminating in a moist

<sup>\*</sup> Yorkshire was not singular, in this disaster. All the Northern counties, I believe, shared a similar fate.

moist one. The soil, unable to exert itself during the dry seasons, became furnished with extraordinary powers; to which the moistness of this summer gave full scope.

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# PLAN OF MANAGEMENT

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## FARMS.

I. The HISTORY of FARM LANDS. The husbandry of the Vale, like that of many other Districts, has undergone a total change by INCLOSURE.

Formerly, the entire margin, and much of the bottom of the Vale, lay in open common FIELD; subject, from time immemorial, to the round of

Wheat, barley, or big.
Oats, beans, or other pulse.
Fallow.

Above these fields, were extensive common sheep walks; below them, common pastures,

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TURES, for cattle and horses; and common

MEADOWS, for hay.

Under this ancient fystem of management, the produce of the District was small fields were unproductive, by incessant plowing, and for want of a change of crops; and the meadows, by being mown, year after year, without remission, and without any other melioration, than what chance floods might partially afford them: while the pasture grounds, overrun with bushes and weeds, were equally unproductive. The principal part of the entire produce went to the maintenance of the oxen and horses, employed in the cultivation of the fields. Even the yeomanry, with all their industry and frugality, starved on their own estates, well soiled as many of them naturally were.

The Inclosures, which have taken place within the present century (see the Art. Inclosures) have not only changed the system of management, and increased the neat produce of the District, perhaps threefold; but have inverted, in a remarkable manner, the

comparative value of lands.

Formerly, the meadow lands were generally esteemed the most valuable part of a town-hip: there have been instances of these lands,

cold-soiled, wet, distantly situated, and unproductive, being exchanged for commonsield lands; which, at present, being naturally well soiled, situated near a town, now inclosed, and laid down to grass, are of five times the value of the old grassland; some of which still lies, in an intermixed unimproved state.

This is the most striking proof, I have met with, of much being to be done, in some cases, by a Change of General Management.

This extraordinary improvement has not been effected, by the mere circumstance of Inclosure; but principally by that of changing OLD ARABLE LANDS TO GRASS, AND OLD PASTURE LANDS TO ARABLE. A change which seldom fails, if properly made, of being highly beneficial to the occupier; and is frequently, as in this case, permanently beneficial to an ESTATE.

The ancient system of management being now nearly extinct,—and no circumstance of it, except the extreme industry and frugality with which it was conducted, being worth preservation,—I shall proceed to consider the Vale as an inclosed country, and describe its present general management: together with the various improvements, which

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which have been made in it, during the last twenty or thirty years.

II. The primary OBJECT of the Vale

#### BUTTER :

put down into firkins; the best of it for the London market; the inferior sorts for the manufacturing towns of West Yorkshire.

Cows, barren, or in calf;

Oxen, and some few younger cattle; and Horses, principally for the saddle, have long been staple productions of the Vale; and are annually sent out of it, in considerable numbers, principally to the southern markets.

BULLOCKS, and great quantities of

SHEEP, are fatted, in the Vale and Moreands, for the ports of Whitby and Scarboough. Of late years,

BACON has been fent, in confiderable quantity, into the West of Yorkshire, and some to be London market.

RABBITS are not a staple article, in the ale, or on its margins, though some good arrens occur.

With respect to vegetable produce,

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#### RAPE

ay be confidered as that which brings most T 2 money

money into the country. Since the inclosure of common pastures great quantities of

have been fent out of the Vale. Also form fmaller parcels of

> BARLEY and PULSE

have of late years been sent down the Der went. But, notwithstanding the goodness the foil, and its fitness for

Salay sold wheat,

very little of this grain has been carried or of the neighbourhood of its growth; havin been wholly.used in the home confumption Of late years, however, there has been overflow; and Whitby has drawn part of i supply, from hence.

Besides these articles of MARKET PRO DUCE, a variety of Subordinate crops a raised; as

GRASS, OF NATURAL HERBAGE; CLOVER, and other CULTIVATED HE BAGE; and the thing the tell to the

TURNEPS, for cattle and sheep; POTATOES, for cattle and fwine: also FLAX (manufactured in the Vale); TOBACCO.

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III. The COURSE OF PRACTICE.
No regular succession, of arable crops and fallow, can be traced, in this District. Every man follows the dictates of his own judgment, and subjects his arable land to such uses, as are best suited to the general economy of his farm, in the given year.

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This mode of management is not peculiar to the Vale under observation, but is common to other Districts, in which GRASS-LAND predominates; under which circumstance, aration is considered as a secondary, and in most cases a subordinate branch of management.

When the sward becomes unproductive, it is delivered over to the plow, and the soil kept in an arable state, until another piece of sward begins to fail; when the former is laid lown again to grass, and the latter broke up for arable.

In the Midland counties, where this alteracy of grass and corn has, in some instances, een in practice time immemorial, a regular ourse of husbandry has taken place. But, here, where this system of management is in is infancy, and where the diversity of soils is almost endless, no regular round of ma-

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nagement

nagement can, with propriety, be at present pursued.

Land which has been kept in TILLAGE century after century, is prone to grass, and will retain its fward, much longer, than land which has been, only a few years, under the plow. And a RICH SOIL, COOLLY SITUATED, will retain its fward, much longer than thin-soiled upland.

There are numberless instances, in which the richer cooler parts of the early inclose common-field lands have now lain, more that half a century, in GRASS: nevertheless, the sward, though perhaps mown year after year and treated with no extraordinary care still remains unimpaired: the herbage welforted, and the produce ample.

Therefore, to subject the lands of this District, circumstanced as they are, at present to any METHODICAL ARRANGEMENT, or REGULAR ROUND OF CROPS, would be a evident impropriety.

The only particular of the management of the Vale, in this respect, which appears to me censurable, is that of suffering thin-soile thirsty upland to lie in a state of sward, per haps as "meadow" (mowing ground,) when

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it would, I apprehend, pay much better, in a course of ARABLE MANAGEMENT. Turneps, barley, wheat, and the cultivated graffes, equally affect it.

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### MANAGEMENT.

THIS COMPLEX subject requires, in the present instance, the following arrangement.

- 1. Species of foil.
  - 2. Subsoils and underdraining.
  - 3. Rough grounds and clearing.
- 4. Tillage.

I. SPECIES OF SOIL. The great diverfity of soils, which the Vale and its environs afford, has been mentioned. Viewed in this light, it is a specimen of country which admits not, perhaps, of comparison. Within the narrow limits of a few miles, BARREN HEATH and LOW FEN LANDS are included; with T 4

almost

almost every intermediate soil: unproductive GRITSTONE LAND; thin stapled LIMESTONE LOAM; deeper and more productive
"REDSTONE LAND\*;" rich deep PEBBLY
LOAM; strong blue CLAY. And what
renders this circumstance still more remarkable, there are instances in which the several
species of soils, here enumerated, are included
within the same farm,

S. J. I o a A farm,

- \* RED-STONE LAND.—This fingular species of soil is composed of loams, of different qualities, intermixed with a greater or less quantity of soft sandy stones, about the ordinary size of slints, and of a dark yellow or orange colour; a species of grit, or freestone. The cultivated soil is, in some instances, nearly half of it made up of these stones; which, some men are of opinion, afford, in themselves, a degree of nutriment to corn crops. An instance is mentioned (of this as of other stoney soils), in which a great quantity of these stones having been gathered off, as an incumbrance to the soil, its productiveness was much lowered; but the stones being returned, the soil also returned to its former state of fertility. Be this as it may, the soil under notice is, beyond dispute, one of the finest corn soils in the island.
- + Pebbly Loam, This foil is noticed, as being the most useful foil, taken all in all, I have any where yet observed. It is equally productive of corn or grass; may be worked as arable land, in any season; and is found enough, in grass, to bear stock in winter. I particularize these soils, as they may, hereaster, with a variety of others, form a separate subject of investigation.

Agmis

A farm, thus variously soiled, is a spur to ingenuity; obliging its occupier to break through those confined opinions, and narrow prejudices, which are too frequently contracted, in countries where a UNIFORMITY OF SOIL, and a REGULAR ROUTINE OF MANAGEMENT, prevail.

This may account, in some measure, for the SPIRIT OF IMPROVEMENT, so conspicuous among the HUSBANDMEN of the country under survey.

II. SUBSOILS. The FEET and SIDES OF HILLS generally abound in LANDSPRINGS, and COLD WET SUBSOILS, caused by the waters, absorbed by the upper parts of the swells, lodging and striving for vent, in the lower regions.

From the cloud of hills which rife to the north of this Vale, it might be expected that a vein of cold land would be found on its margin; but observation proves the contrary.

The waters of the Morelands find vent, in the dales and dingles with which they are intersected, and are entirely cut off from the Vale, by a deep valley, which lies between the moreland swells, and the range of limestone heights that form the immediate banks of the Vale; while the heights, themselves. felves, being in all human probability formed entirely of fiffured rock, receive into their bosoms the waters which their soils absorb, and which sink below their bases, or rise in rocky fountains at their feet.

Near Pickering, the RIVER COSTA takes its rife; not gushing forth, as from the mouth of a cavern, but rising, at numberless apertures, through a filter of sand, which has probably been brought out of the sissures of the rock; the entire river, or rather river-like brook, rising within the compass of a few acres.

It is a fact worthy of attention, though perhaps easily to be accounted for, that a tract of country, containing about twenty square miles, lying above this efflux, has scarcely another SPRING belonging to it, nor scarcely a perch of SPRINGY SOIL upon its surface.

The limestone and redstone lands lie all on ROCK, above the level of this spring. The pebbly loam, which lies below it, is equally fortunate in a seam of GRAVEL, which, tho it lie some seet beneath the surface, renders it sufficiently dry to be worked, at all seasons, and to carry stock, in winter, with impunity.

Under

DRAINING is rendered useless; and no instance of it occurs in this neighbourhood, except in the improved peatbog, which was mentioned under the article Planting; and which lies in the immediate vicinity of the source of the Costa; by whose waters, before the channel of the river was made, that bed of moor had been formed. The wetter parts of the area received considerable improvement from underdraining.

But altho' the substructure of the MARGIN is such as to preclude the use of underdraining, that of the swells, which rise in the BOTTOM OF THE VALE, renders this operation frequently necessary; and, in some few instances, it has been practised with great success.

In the instance which I most particularly attended to, thirty acres of cold unproductive land, lying on the skirt of one of those hillocks, was, by underdraining, improved to more than twice its former value. From a state of rushy ill grassed sward, it was raised, first to a piece of productive corn land, and is, now, a sound well herbaged grazingground. The MATERIALS, in this case, wood. No stones, in the neighbourhood.

In the MORELAND DALES, underdraining would, in many cases, be a valuable improvement; and, there, stones are abundant.

The offal freestones, which lie an incumbrance to the quarries of the margin, would pay well for carriage, into the bottom of the Vale.

III. THE RECLAIMING OF ROUGH GROUNDS. The inclosures of commons and waste lands, which have of late years taken place, have directed the attention of husbandmen, toward the clearing and breaking up such lands, for the purposes of AGRICULTURE.

- 1. Sonburning. The practice which has gained the greatest estimation is that of sodburning provincially, " paring and burning:"—a practice which is little known in many parts of the island; but which ought to be well understood by every husbandman in it.
- 1. Paring. The bushes and other incumbrances of the surface being removed, the sward is inverted, with the breast plow, provincially, "paring spade,"—in sods, about a foot wide, and three feet long.

The judgment requisite, in this stage of the process, lies chiefly in determining the proper

THICK-

THICKNESS of the fods. If they be pared too thick, they are difficult to burn; if too thin, the sward is not effectually destroyed, and the produce of ashes is too small. A rough spungy surface ought to be pared, thicker, than one which is firm and bare of grass; and a light shallow soil ought to be pared, thinner, than one which is deeper and more tenacious. An inch may be considered as the medium thickness.

The attention required, in this part of the business, is principally to see that men, who work by the acre, break off the fods at proper lengths, and clear them effectually at their outer edges.

The price ten to twelve shillings an acre, varying principally with the freeness of the soil. Roots are detrimental, but stones are the greatest enemies, to the paring spade.

2. Burning. If the fods be naked, and the feafon moift, they are "fet," on-edge, to dry; if graffy, and the weather be fine, this labor may, with propriety, be spared.

The met bod of burning is, invariably, in finall beaps \*, a rod or less afunder, according to

\* For the greater conveniency of burning the fods, as well as of spreading the ashes.

to the quantity of fod; but the way of forming the beaps is not fixed. li

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The bottom is generally made, in a round form, about a yard in diameter, with fods fet on-edge. Some lay, on the windward fide of this bottom, a bough of furze, or other kindling, with the brush end outward, covering it above with the graffiest and driest bits of sod; and then make up the heap, in the form of a small haycock; keeping the sods, on the inside, as hollow as may be; but laying them slat and close, on the outside, to keep in the heat.

The heaps, made in this manner, are kindled, with a bough of lighted furze,—or, which is better, a link, made of tow dipped in tar, and wound round a small stake or other stick;—the lighter running along the rows, from heap to heap, setting fire to the kindling.

Others, having formed the bottom, as above described, carry up the heap, with a chimney, in the middle; kindling it with a shovelfull of live ashes, thrown down the chimney. When kindling materials are scarce, this may be the more eligible method.

When the fods are under-dry, much skill is requisite in forming the heap. The art

lies, chiefly, in keeping it light and hollow within; and, whether it be made with an eye, or a chimney, in having due regard to the windward fide. A little practice, and proper attention, will readily supply the rest.

If the heaps be made too large, at first, their own weight crushes them down, and destroys the necessary openness of the innerside; if too small, the fire, not being sufficiently confined, slies outward, and spends itself, prematurely.

The heaps well on fire, fresh sods are laid on, from time to time, until the whole are expended; not more than half of them, perhaps, being used in forming the original heaps.

In "beating up" the heaps, the fresh sods are laid upon the side, on which the fire is the strongest; the addition being seldom made, until the fire begin to make its appearance, on the outer side of the heap.

When all the fresh sods are expended, the unburnt pieces, which slide down the sides of the heaps and lie round their skirts, are laid upon the top, and the whole reduced to ashes, or at least exposed to the free action of the fire.

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The burning is principally done, by women, by the day: sometimes the paring and burning are let together, by the acre. The price of burning five to six shillings an acre.

3. Asbes. The most general method, and that which seems to be in the best esteem, is to spread the ashes, as soon as they are cool, or perhaps while yet warm, and to plow the land, immediately, for the crop, with a shallow furrow, to prevent the ashes from being buried too deep in the soil.

Sometimes the foil is only rice balked, or

half plowed, -not plowed clean.

Perhaps the most effectual method of mixing the ashes with the soil, the great thing to be desired, would be, first, to rice-balk, across the ridges; and, then, to gather them up, with a clean plowing.

This summer has afforded me an opportunity of observing a singular INNOVATION,

in the art of fodburning.

Instead of the sods being dried and burnt, and the ashes spread on the pared farface, and plowed in, under surrow, the land, in this instance, was plowed, immediately, as the paring was finished, the sods dried and burnt, and the ashes spread upon the plowed surface,

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In executing this method, the ridges of the lands were cleared, five or fix feet wide, by throwing back the fods upon the fides of the lands; and, as the ground was plowed, the fods were returned to nearly their former fituation; being thrown on, rough, over the plowed ground. One plow took about three women, at tenpence a day, to follow it. The extra expence half a crown to three shillings, an acre.

The advantages proposed, by this novel practice, are thefe: first, that of fecuring a burning season, with a degree of certainty, and without the expence of " fetting" the fods; which being kept hollow, underneath,. by the inequalities of the plowed furface, a free circulation of air is admitted, and the evil effect of regrowing to the ground, entirely prevented; and fecondly, those of mixing the ashes more intimately and more evenly with the foil, and of preventing their being buried too deep, by the first plowing; which, in this instance, was necessarily given very deep, the foil being of a moory nature, and in a state too tender and moist to be plowed with a shallow furrow; which would

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not have laid the surface sufficiently dry, for turneps,—the intended crop.

Therefore, in this case, the management was obviously judicious: and whether the advantages of FORWARDING THE DRYING, and of being able to use the ashes as a TOP-DRESSING, may not render the practice generally eligible, can be ascertained by experience, only.

4. The time of fodburning depends upon the feason and the intended crop.

It is always unadviseable to pare in a wet feason. The covering moist and feeble, and the sods sopt with wet, fall heavy and flat to the ground. The grass soon rots; and if the season continue moist, the roots will, in a little time, regain a footing in the soil.

On the contrary, fods pared in dry weather fall light off the spade, and are kept hollow, underneath, by the grass or other covering, which, in a dry season, are rigid; bearing up the sods from the ground; thereby admitting a circulation of air beneath them. By this means, the extra expence and trouble of setting is avoided, and the process of cineration rendered much less difficult, and irksome.

The crop, therefore, ought to be, in some measure, subservient to the SE ASON.

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5. The crops most in use, for sodburnt lands, are WHEAT, RAPE, TURNEPS, BIG, OATS. It is feldom, however, that a paring feafon can be got, early enough in the spring, for either of the latter crops; the last more especially. Big, however, is frequently fown on burnt land, the latter end of May, or the beginning of June, with success. RAPE and TURNEPS are the most general crops, and upon the whole, perhaps, are the most eligible: the month of June is a leifure time, and generally a good burning feafon. ever, WHEAT, provided the land were fallowed, and the foil and ashes mixed together, by repeated plowings and harrowings, between the burning feafon and feedtime, does not appear to be an ineligible crop.

There have been instances, I am told, in which the ashes (having been spread in the middle of summer) were suffered to be grown over with grass; which being turned under in autumn, wheat has been sown on one plowing, with good success \*.

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appears to be one of the fources of improve-

<sup>\* 1796.</sup> This is, in theory, a most eligible practice; and is entitled to full attention, on breaking up old rough grass lands.

ment, which, being yet imperfectly understood, require every effort of the farmer and the philosopher, to bring them nearer to perfection.

At present, the practice is confined to a few Districts: and in those it is applied to particular purposes, only: while the principal part of the kingdom is a stranger to its uses.

It does not appear to be confidered, even in this District, as a GENERAL SOURCE OF MANURE; but, merely, as being applicable to the reduction of old tough fward.

For even here, where it has long been in common practice among discerning husbandmen, there are men who still see it as a bugbear, too terrible to become familiar with. The false notion of "fending the soil into the clouds," frightens some; while the better-founded idea of reducing it all to ashes—by too frequent repetition of this operation—is a stumbling block to others.

Whoever will attend to the quantity of earth in the fods, and the quantity of ashes produced from them, will lose his fears about the foil being lessened by this operation.

Supposing the sod to be an inch thick not more than one fourth of it, perhaps, i

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foil; and this, so far from being reduced in bulk, to an alarming degree, is perhaps increased in size, by the action of the fire; which, by leaving it, in an open porous state, renders it more bulky, than the same soil, shook from the sods and reduced to a perfect state of dryness only, would probably have been.

I will not contend for the increase, nor will I, at present, admit that the soil is lessend, by the operation. Different soils are acted upon in different ways, by fire: CLAY burns to bard cinders, of the nature of brick, remaining in the soil, unaltered by time; while the cinders of lighter soils are more perishable.

These effects of sodburning do not appear to have been attended to. Its use in reducing tough sward strikes every one; and its effect, as a manure, in the cases in which it is usually applied, is here clearly understood.

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But its effect, in IMPROVING THE CON-TEXTURE OF STRONG COHESIVE SOILS, has escaped general notice. Yet how could art devise an ingredient more likely to give openness, and freedom, to a closely textured soil, than rough, porous, unperishable ashes? a material of improvement which the soil itself supplies, free of cost. The immediate ac-

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quifition

quisition of MANURE repays the expence of the operation. The more PERMANENT IMPROVEMENT of the CONTEXTURE of the soil is obtained, of course, without expence.

Viewed in this light, SODBURNING, whatever effects it may have, on light porous foils, is, in all human probability, a cardinal improvement of foils, of a CLOSE CLAYEY NATURE: and it appears to me a matter incumbent, on every possessor of such soils, to try, on a small scale at least, the effect of a FREQUENT REPETITION of this operation.

2. Furze grounds. It is the opinion of one, who has paid close attention to the subject, that old furze grounds, off which fuel having been repeatedly carried, are of course much depauperated, may be improved in the following manner.

Grub up; fow grass seeds, on the grubbed surface, without plowing; and let the land remain in this state, until it has acquired a degree of sirmness, the smaller roots lest in it are decayed, and the surface has got a covering. Then sodburn, lime, &c. and break up the soil, for a course of arable crops; closing with cultivated herbage. When the furzes begin again to grow troublesome, repeat the sodburning.

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2. WOODLANDS. The fame inventive husbandman has struck out a simple and certain method of freeing grass land from the SLOETHORN, - one of the hardiest forubs which husbandry has to contend with.

If black thorns be grubbed up by the roots, every fibril, left in the foil, produces a fresh plant; fo that, instead of being lessened, by this tedious and expensive operation, their number is encreased. The bousement shot whiten

If they be felled, aboveground, the stubs are in the way of the fithe, and the bite of cattle; and the thicket is presently renewed.

But if they be CUT OFF LEVEL WITH THE SURFACE (or fomewhat beneath it), the fithe has free fweep, and the young shoots are of course removed, with ease and certainty. Av or sound has some aniso ways

If the ground be mown for hay, the same stroke, which cuts the herbage, takes off the ligneous shoots. The Exercise One and

If pastured, cattle and sheep, provided they have no woodland left to brouze among, will gnaw them to the quick; scarcely leaving a stem or a stump remaining. It is, however, always adviseable, in this case, to sweep the ground over with the fithe, in the course of the fummer feafon; to remove, effectually,

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the remains which may have escaped the bite of the pasturing stock.

The fecond year, the shoots rife weak; and the roots, themselves, seldom survive the third year. In a very sew years more, the roots are found entirely rotten; thus becoming a source of nutriment to the crop, instead of remaining a nuisance.

If a thicket, or a border, whose fward is nearly lost, be treated in this manner, rubbish of every kind should be raked off, a few GRASS SEEDS scattered on, and the surface run over with a roller, as a preparation for the sithe.

This mode of extirpation is not applicable to the SLOBTHORN, only; but to the OAK, the ASH, the HAWTHORN, the MAPLE, and every other tree and shrub, to which it has been applied,—the FURZE and the BRAMBLE excepted.

GEN. OBSERVATIONS ON RECLAIMING FOREST LANDS. It is, I believe, a univerfal practice, when woodl and is given up to husbandry, to take up all the roots, large or small, at an expence, perhaps, equal to half the value of the land; which, in this case, is subjected immediately to the plow: altogether, the most rugged operation, which husbandry is acquainted with.

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But how much more eligible would it be, to treat fuch land, in the manner above described? keeping it in a state of GRASS, until the roots were decayed, and rendered obedient to the share.

The fums of money (one might fay the fortunes), which have lately been expended, in the IMPROVEMENT of ENFIELD CHACE. are too well known; and will, it is to be feared, throw a damp on the further improvement of the ROYAL WASTES: a concern of some importance to these kingdoms.

But how easily, and with what certainty, might these wastes be improved? The woon, upon most of them, is doubly sufficient to make the necessary improvement.

Take down the TIMBER TREES, and the POLLARDS, by grub-felling, in the Norfolk manner: remove fuch of the LARGER ROOTS as will pay amply for removing; and fill up the holes, with the cores of ant-hill, or other protuberances, with which these wastes generally abound; fowing grass seeds on the furface. disolvente no one de construit an lat of

Treat the UNDERWOOD, and other BRUSH wood in the manner above described; and reduce the whole to a state of GRASS; keeping it carefully fwept with the fithe, until the the REMAINING ROOTS be SUFFICIENTLY DECAYED.

Then, but not before, bring the foil under a course of ARABLE MANAGEMENT.

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The fencing, the castration of ant-hills \*, and perhaps doing away a few other roughnesses, would be the only labor requisite, which would not more than repay itself +.

The ROOTS, instead of being a principal cause of expence and anxiety, would, under this management, become a source of IMPROVEMENT OF THE SOIL; while the EXPENCE, of bringing the soil under a course of ARABLE MANAGEMENT, would be in a manner precluded, by having a free graffy surface, suitable to the purpose of son-burning.

This township (part of the ancient forest of Pickering) affords at present (August 1787) numberless instances of the great UTILITY of SODBURNING MAIDEN SWARD.

In adjoining allotments (see the Art. In-CLOSURES) without a shade of difference, as to soil or situation, the crop, after sodburning, is, in some instances, fourfold that of the crop, sown

<sup>\*</sup> See Norf. Econ. Min. 50.

<sup>+</sup> If DRAINING be found requifite, how fuitable is the opportunity, while land remains in grafs.

fown on one plowing of the natural sward; and this notwithstanding the favorableness of the present summer, towards the latter process. Had the season proved dry, oats sown on one plowing of the thinner soils, must have perished; or, at best, must have remained in a dwarfish unharvestable state. There are oats, even this year, not six inches high; and others, too weak and straggling to ripen as a crop, have been swept down with the sithe, and raked together, as sodder.

It is observable, however, that, on the deeper soils, there are, this year, some sine crops of oats, on the natural sward.

The cause of this disparity, between the produce of deep and shallow soils, is obvious. The surface of soils which have remained, from century to century, in a state of sward, is, in a manner wholly, occupied by the roots of grasses and other plants; forming a tough mat of sibres; reaching, in some cases, several inches deep; especially over a cold moist subsoil; where the sedgy tribe are frequently in full possession.

If the soil be thin, it is wholly occupied by roots: the plits, or plow flices, afford no loofe mold, for covering the feed; which either lies exposed on the surface, or falls through through the seams, upon an infertile subsoil, and among grass, still perhaps in a growing state. The sew grains, which happen to get buried in the mold, sourish, while their own substance lasts; but the kernel once exhausted, the rootlings look out, in vain, for other sustenance; the soil is already occupied, by veteran roots, too powerful for the infant sibrils to contend with.

But, if the SOIL be DEEPER THAN THE SWARD, the feeds get properly covered, and the young plants have fresh mold to strike root in; and to support them, until the sward die, decay, and afford nourishment to the rising crop,

The uses or sodburning, thick-fwarded foils, are those of effectually killing the fward; doing away the toughness of the plits, and furnishing, in the ashes, a supply of acceptable pabulum to the infant plants.

Out of this statement of effects result these general conclusions.

RICH, DEEP SOILS, though covered with old sward, may be sown with corn, on one plowing.

It is reasonable, however, that this plowing should be given, some time before the seed be sown; for the double purpose of exposing posing the inverted plow slices to the meliorating influence of the sun and air, from which they may have long been estranged; and of FORWARDING THE DIGESTION OF THE SWARD.

It is likewise observable, that, in this case, a DOUBLE PLOWING (burying the sod at the bottom of the surrow) is obviously preserable to a single one.

But shallow, less fertile soils will not bear this treatment: they require either to be SODBURNT, or FALLOWED, to reduce the sward and meliorate the soil.

But fallowing is expensive, loses, unnecesfarily, one year's crop, and does not change the texture of COHESIVE SOIL; to which, whether deep or shallow, sodburning appears to be singularly well adapted.

The length of these reslections will, I trust, find an excuse, in the magnitude of the subject which gives rise to them. The ROYAL FORESTS, and numberless PAROCHIAL WASTES, afford at present little benefit to the community; but are capable of affording great national advantage. To endeavour to forward their improvement, by pointing out the easiest method of accomplishing it, is, therefore, the duty of every man, whose experience

experience has led him to reflections on the fubject.

Improvements, thus conducted, would be progressive and pleasurable; requiring no extraordinary share, either of attention or capital.

IV. TILLAGE. In a country in which GRASS LAND is the PRIMARY OBJECT, excellency in the minutiæ of the ARABLE PROCESSES must not be expected: nevertheless, where the invention is let loose, and a spirit of improvement prevails, we may hope to find some SPECIAL MATTER worthy of notice.

The only particulars, which appear to me noticeable, in this place, are,

- 1. Plowing with reins,
  - 2. Laying lands across slopes.

PLOWING WITH REINS. In this refpect, the husbandmen of the Vale excel. Various as are their soils, they plow them, invariably, with Two Horses, driven and guided with REINS; which at once answer the purpose of guiding and driving: thus far exceeding the less handy line, and the hand whip of Norfolk \*!

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See NORFOLK; Section IMPLEMENTS.

Proper feasons for the operation are endeavored to be caught; but, even with this advantage, it is matter of astonishment, how some of their strong deep soils are turned, by a pair of light slender horses; which, in a balance, would barely outweigh one of the four (or perhaps six) which are used upon the hills of Surrey and Kent, in plowing soils of less tenacity!

In Norfolk, the soil is light, and the great merit of the Norfolk husbandmen lies in their expedition. Here, where the custom is to go only one journey, the quantity plowed, in a day, is much less than in Norfolk; but generally more, even in the stronger soils, than is done by two men and sour expensive horses, in many other places.

It has been a generally received idea, even among men who think liberally, and are inclined to think well of the practice of plowing with a pair of horses, that it is only applicable to LIGHT THIN SOILS. But the established husbandry of this country proves that idea to be erroneous.

It strikes me, however, advocate as I am for the practice, that, in some cases, especially where the soil is DEEP AND TENDER, three horses, at length, would be preserable.

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But the plea held out against this manages ment is, "We cannot afford it"! The truth is, land here has got up to the TWO-HORSE-PLOW PRICE; and tenants seem to be aware, that they cannot pay their rents, if they send more than two horses and one man to plow. What a strong recommendation is this of the practice.

2. LAYING LANDS ACROSS THE SLOPES OF HILLS. The general practice, unless where the turnwrest plow is in use, is to plow the sides of hills, up-and-down, laying the lands parallel with the line of descent, not obliquely across it \*.

Where the subsoil is abforbent, this is perhaps the most eligible method; the rainwater which falls on the land being, by this means, effectually prevented from making its escape, off the side of the hill. For, unless ridges be raised very high, the water, in this case, has no propensity toward the surrows, on either side; its tendency, when the lands lie stat, being down lines lying parallel between them: consequently, the rain water, which salls upon them, may run from the top to the bottom of the hill, without finding its

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<sup>\*</sup> But fee the West of England; -Section WHEAT.

its way into the interfurrows, which, in this case, are rendered entirely useless, as sur-

This circumstance renders the common method of plowing the sides of hills altogether ineligible, where the subsoil is cold and retentive; and where the subsoil is cold water is of course required to be got rid of, the quickest and shortest way.

To this end, the lands are thrown ACROSS THE SLOPE, nearly parallel with the horizon, merely giving fufficient descent, for water to find its way along the interfurrows.

The EFFECT of laying the lands in this direction is evident: the rain water, which falls upon them, has never farther to run, than the width of the bed it falls on; (even supposing it to fall on the upper edge) for so soon as it is caught by an interfurrow, the vegetable pasture is relieved from it.

Hence, the narrower the lands, provided the interfurrows be sufficiently deep, the more immediate the effect.

The only INCONVENIENCY, of laying lands across the slope, is that of having the plits, on the lower sides of the lands, to turn against the bill; an operation which requires a good workman to do it properly.

Vol. I.

But there is an ADVANTAGE, in this method, which more than overbalances that inconveniency. The PULL is always upon, or nearly upon, LEVEL GROUND; whereas, in the common direction of the lands; the uphill pull is intolerable to the beafts of draught, especially to horses; which, through fear or impatience, draw by jerks, eager to reach the top of the hill; thereby fatiguing themselves and the plowman, unnecessarily, and rendering the work desective.

The good effect of laying lands across flopes, is not only plaufible, in theory, but is verified, by practice. I have seen an instance, in which land, which had heretofore been cold and poachy, improved, merely by changing the direction of the ridges, to DRY, SOUND, PRODUCTIVE soil, worth nearly twice the rent, it was, before this simple alteration took place.

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The waters of " New TON-DALK-WELL Lave long been calebrated, for dieirlightacs in cold bathing and, for nyangthening the

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## MANURES

Footeing yours, RIGHT CHA Service upon

## fome certain Sunday in the luggmer/august MANAGEMENT

to colebrate the virtues of the water

THE SPECIES OF MANURE that are used in the District are,

1. Afhes.

3. Lime.

2. Marl.

4. Dung.

I. ASHES are used, chiefly, in the MORE-LANDS, where great quantities of turf and peat are burnt upon the hearth, for the double purpole of FUEL and MANURE; the alhes being confidered, as equivalent to the expence of collecting the materials.

II. MARL. This is not found, in quantity, as a fossil, either in the Vale or the Morelands. The only marl, which has been used as a manure, is a produce of petrifaction. This marl, and the fountain from whence it flows, are noticeable.

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The waters of "Newton-Dale-Well" have long been celebrated, for their virtues in cold-bathing; and, for strengthening the limbs of children, they are, I believe, celebrated justly. An anniversary, relative to these waters, has been observed, time immemorial; and is still observed, by the neighbouring youth, who meet at this fpring, upon fome certain Sunday in the fummer months, to bathe; and-a poetic mind would add,to celebrate the virtues of the water.

The fituation of this spring is fingularly wild and romantic: the country, on every fide, mountainous and barren, excepting the narrow dale, or cultivated chafm, near the head of which the spring is situated.

At the time these mountains and this chasm were formed, the water, it is probable, gushed out of the face of a perpendicular rock, which now rifes about eighty feet above the fpring; but, through the mouldering of the rock, and the accumulative effect of the waters, the base of the precipice, out of which they iffue, now reaches, with a sharp ascent, to near the mouth of the spring.

The upper part of the flope, at least, has evidently been raifed, by VEGETATION and PETRIFACTION. Had not the hand of art

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been affilting in removing, from time to time, the accumulated matter, in the form of " marl" and "limestone," and in leading the water by a channel from the rock, the fpring might, long fince, by overgrowing its mouth, have been the cause of its own extinction.

These waters, at their source, are remarkably cold, and strongly CHALYBEATE to the tafte, tinging their bed of a deep rust color; but, as they fall down the base of the hill, they lose, by degrees, their chalybeate qualities; losing them, entirely, before they reach the foot of the flope.

What is equally observable, their PETRI-FACTIVE quality is, at the fource, barely perceptible, and does not acquire its full effect, until they have run some twenty or thirty yards down the flope; about which point, they lose, almost entirely, their chalybeate tafte; though they still continue to tinge the channel; the color growing fainter, as the length of channel increases \*.

Where the rill meets with no vegetable matter, to petrify (or rather to incrust), it grivest thouse a

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<sup>\*</sup> This fpring, which is at least an object of curiofity, and whose waters may contain medical virtues which require to be pointed out, is fituated about two miles from Saltergait-inn, on the road between PICKERING and WHITBY.

forms an INCRUSTATION, at the bottom of its channel; which, in time, being filled to the brim, the waters overflow, spread over the slope, and incrust every thing which falls in their way; until having found some hollow channel (or perhaps in a state of nature having reached the sace of the rock), they form a fresh rill; which being annihilated, in the same manner, the waters proceed, and return, along the sace of the slope; thus forming, in an undisturbed state, a natural semi-cone,

Where the surface has been free from moss, or other vegetable production, the accumulated matter is wholly calcareous; of a light colour, resembling the MARL of NORFOLK; except in its being discoloured, more or less, with a chalybeat tinge. Where moss, liverwort, and other vegetables have been incrusted, a stone-like substance is formed: the former is called "marl,"—the latter "stone."

At present, the face of the slope is hollowed out, into great irregularity, by digging for, and carrying away the marl; leaving masses of stone, some of them containing many cubical seet, standing above the present surface.

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These stones, though light, being full of hollownesses within—mere bundles of moss and alga—have, by being long exposed on the surface, acquired a very great degree of hardness; their smallest asperities being with difficulty broken off.

By immerging the fragments in the marine acid, weakly diluted, the calcareous incrustation is leisurely dissolved; leaving the vegetable matter, entire, and, to appearance, as perfect as when it was first incrusted; tho it may have lain, locked up in that state, a thousand, or many thousand years.

These vegetable stones, likewise, have been carried away, and burnt as LIMESTONE. The quantity of lime, however, produced from them could not be great; but mixed with the ashes of the vegetables, a valuable manure may nevertheless be formed.

In a fituation fo recluse, it is no wonder this valuable source of manure should have been, in some degree, neglected. The bottom of the dale which winds below it, does not appear to have been much benefited, either by the waters, themselves, or the matter which they have formed. The principal part, of that which has been taken away, has been carried, up a winding road, over the top of the mountain, to a neighbouring dale (Goadland) some three or four miles distant.

Over and above the difficulty and expence of carriage, a shilling a load has been paid, to the leffee of the royalty, for these calcareous fubstances; not for the purpose of experiment, but in pursuance of established practice; a sufficient evidence, this, of their virtue as a MANURE.

III. LIME. This is, at present, a favorite Manure, in the Vale. It is used invariably, I believe, on every species of soil, and in most cases with great success. It seems to be, at prefent, a received idea, that the business of aration could not be carried on, or at least that the present rents of land could not be paid, without the affiftance of lime.

It is not my intention to attempt to prove, or disprove, the truth of this opinion. Suffice it for me to fay, in this place, that I am not acquainted with any country, in which lime is held in fuch high repute, nor where the manufacturing of it is to common a practice among farmers, as it is in this. Almost every principal farmer, upon the margin, burns his own lime, and want noise west

There are, besides, great number of " sale kilns" for imaller farmers, and for the centre of the Vale, where no materials for burning are to be had. There is an instance of one man occupying eight or ten kilns; burning two or three thousand chaldrons, yearly.

The LIME HUSBANDRY of this Diftrict, therefore, merits particular notice. Subject requires the following division:

- 1. The materials burnt.
- 2. The method of burning.
- 3. The cost, and the felling price.
- 4. The foils, and the crops to which it is applied.
- 5. The method of applying.

I. MATERIALS. On the NORTHERN MARGIN of the Vale, lime is burnt folely from flones, of different colours and contextures. The species most prevalent area ftrong grey LIMESTONE GRANITE; and a species of blue and white MARBLE, the blocks, whether large or fmall, being blue at the core, and lighter-coloured toward the outer furface. The lower blocks are block a

One hundred grains of the former, taken from a lower stratum of PICKERING-CASTLE-BANK, yield fortythree grains of air, and ninetyfour grains of calcareous earth, leaving a refiduum of fix grains; chiefly a brown filt, with a few gypfum-like fragments.

One hundred grains of the latter, taken from the lower stratum of a quarry, near KIRBYMOORSIDE, afford thirtynine grains of air, eightysix and a half grains of dissoluble matter; and thirteen and a half grains of residuum, fine impalpable silt.

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The lime, produced from the former, is of a dusky colour, and falls in rough coarse GRAINS\*; that, of the latter, bursts into a white volatile flour-like POWDER.

The stones of different quarries are different in quality, but none of them differ widely from the specimens above described.

On the SOUTHERN HEIGHTS, the prevailing material is a fingular species of SOFT CALCAREOUS GRANITE. Its colour a dirty white: its contexture resembling the grains of white mustard-seed, or the roe of fish, run together with a cement of chalk or marl +. The hardness of this stone (if it merit the name) increases with the depth of the quarry. The lower blocks are used in building; but the upper stratum, for three or sour seet below the soil, is generally a STONE MARL

<sup>\*</sup> Each grain being composed of a series of eggshaped shells, inclosed within each other,

<sup>†</sup> Relembling, in contexture, the lime of the Pickering

of no mean quality, but varies in different quarries. I have not learnt, however, that in any instance it has been applied as a MANURE. On the contrary, it appears to be universally cast, as an incumbrance, to the bottom of the quarry \*.

One hundred grains of the MALTON STONE, taken from the middle of the quarry opposite the Lodge at New Malton, yield fortysour grains of air, and ninetyseven grains of calcareous earth, leaving three grains of residuum, chiefly a brown silt.

But the stones of different quarries vary in quality. One hundred grains, taken from a newly opened quarry, by the side of the road

\*On this side of the Vale, too, the limestone rubble which lies between the soil and the rock, is much of it of the nature of MARL, and might in many cases be applied, as such, with advantage, Its effect, where it has been thrown back from the edges of the quarries on Scallowmoor (a light loam inclining to a black moory soil) above Pickering, is striking. The earth of this rubble is strongly calcareous, and its stones are frequently covered with a white efflorescence, which is purely calcareous. Great quantities of it might be collected; and where a sit soil can be found (by trying experiments with it on a small scale) in the neighbourhood of a quarry, it would, in all probability, pay amply for setting on. For the bottoming of farmyards and dunghills, the entire "coping," the soil inclusive, would be found excellent.

yield only ninetyfour grains of diffoluble matter.

I mention this circumstance, as the plot of ground, in which this quarry is dug, was bought, it seems, at an extravagant price, for the purpose of burning lime; but the lime, it is faid, proving of an inferior quality, a principal part of the money will be sunk. This shews the great use of analysis, in ascertaining, without hazard, a knowledge of the qualities of limestones.

One hundred grains of WOLD CHALK, taken from a lime quarry near DRIFFIELD, yield fortyfour grains of air; three and a half-grains of a foft mucilaginous refiduum; and ninetyfix and a half-grains of calcareous matter †.

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\* In this case, however, if the specimen, I happened to take, was a fair one, the bad quality of the lime cannot be altogether owing to the stone; which, by this analysis, is far from being a bad one, though inferior to that of the preceding experiment.

† In these experiments the quantity of CALCAREOUS MATTER is inserved from the quantity of RESIDUUM, no more of it being precipitated, than a sufficiency to shew its colour; which, in every case, was of snowy whiteness; a principal evidence of its being a pure calcareous earth. The quantity of AIR and the quantity of RESIDUUM were, in each experiment, closely attended to.

- 2. BURNING. In giving the detail of this operation, the following fubdivisions will be requisite; perform to vist from a reach boing
- Building the kiln.
- 2. Raifing and breaking the stones.
- 3. Coals and their proportion.
- 4. Filling the kiln, which on so wied
- 5. Drawing the kiln.
- 1. The kiln. The materials are either limestone, entirely, or limestone, lined with bricks on the infide. Neither timber, nor mortar, is here used, in building a lime kiln; the former presently decays, and the latter, by alternately swelling and shrinking, bursts the walls; besides rendering them, in the first instance, too tight to admit a proper quantity of air: no other air holes, than the "eyes" at which they are kindled, being made in the kilns of this diftrict \*.

The form of the cavity is an irregular cone inverted. At the bottom, are generally two eyes, opposite to each other; the cavity being here contracted to a thin point, or narrow trough; the width that of the eyes. As the walls are carried up, the cavity takes, by de-

• 1796. In some Districts, where tight walls are in use, small air holes are left to give the requisite supply. See MID. ECON. Min. 2.

grees; bereing by the chaldron, will son,

grees, a circular, or fometimes an oval line; at the same time receiving, as it rises, a conical form; until, having reached somewhat more than half its intended height, the form is changed to cylindrical; or is sometimes contracted towards the top. The proportion, between the depths and the diameters of these kilns, is that of the depth; being, generally, about one and a half diameter of the top.

The fize varies from fix to forty chaldrons.

2. The stones. The art of raising stones can only be learned by experience, in the given quarry in which they are to be raised. They are sometimes raised by the day; sometimes by the load; but, most generally, the entire labor of burning is taken, together, at so much a chaldron of lime.

The breaking, of hard strong stones, is a laborious part of the operation of limeburning. On the north side of the Vale, it is done, by men, with large sledge hammers; but, on the Malton side, where the stone is soft, women are frequently employed in breaking.

The medium fize is that of the two hands; but men, burning by the chaldron, will not, unless well attended to, break them so small: stones, nearly as big as the head, are sometimes,

times, but very improperly, thrown into the kiln; for unless the proportion of coals be unnecessarily large, the furface, only, is burnt to lime, the core remaining a lump of una half to three and a half for orsenoth dirud

3. Coals. The Morelands, for the last fifty years, have furnished the north side of the Vale with coals, for burning lime, and for an inferior species of fuel. The seam of this coal is thin, and the quality, in general, very with Rones and coals, in thin alternal transform

Before the discovery of these coals, lime was burnt with furze, and other brushwood; but notwithstanding the Morelands are, now, nearly exhausted of coals (unless some fresh discovery should be made), the District is relieved from the apprehension of returning, again, to its ancient mode of burning lime. The Derwent, beside an ample supply of coals for fuel, brings an inferior kind (both of them raifed in West Yorkshire) for the purpose of limeburning. The eastern end of the Vale is equally fortunate, in this respect, by having the port of Scarborough in its neighbourhood. And see INL. NAV. p. 15.

The proportion of coals and stones varies with the quality of the coals, and likewife, but in a less degree, with the quality of the

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the proportion. Three chaldrons of line from one of coals (the measures equal) may be considered as the mean produce. From two and a half to three and a half for one, includes the whole extent of produce of well burnt lime.

the eyes, and an extraordinary proportion of coals at the bottom of the kiln, it is filled up with stones and coals, in thin alternate layers; those of stones being five or six inches thick; with coals in proportion; the coals, if not sufficiently small, being previously reduced to a gravel-like state; in order to run down, more freely, between the interstices of the stones, and thereby to mix, more evenly, with them.

The materials are cast into the kiln, with large scuttles, or shallow baskets; which are filled with stones, by means of an iron-toothed rake, composed of four teeth, about six inches long, of a head about a foot long, and of a handle about four feet long.

If several men be employed, in filling a kiln, it is common for each man to fill and empty his own scuttle. But this is an uncertain, and therefore an improper, way of proceeding.

ceeding. Much depends on the regularity and evenness of the layer, and the due proportion of coals; and to judge of this, with fufficient accuracy, requires fome experience, and a steady eye; especially when the kiln is on fire, and the cavity to be filled up is obfcured by fmoke. If more than one person be employed, in this case, it is highly probable the work will be imperfectly done.

Among the fale kilns, about Malton, there is an excellent regulation, in this respect. The scuttles are all filled, and brought to the top of the kiln, by women and Boys, who deliver them to the MASTER, or his foreman, standing there to receive them, with his eye fixt within the kiln; by which means he is enabled to distribute the stones and coals, with the greatest accuracy.

5. Drawing. There are two species of kilns; or rather one species used in two different ways. o asnot myed-plane ist

A kiln which is filled, fired, and suffered to burn out, before any of its contents be drawn, is called a "STANDING KILN."

If the contents be drawn out, at the bottom, while the upper part is yet on fire,the vacancy at the top being repeatedly filled up with stone and coal, as the lime is ex-YOL. I. tracted tracted at the bottom,—the kiln is termed a "DRAW KILN."

Since coals have been used in the burning of lime, draw kilns have, until of late years, been most prevalent. But, at present, standing kilns are most in use.

The reasons given, for this change of practice, are these: first, that the lime is burnt, evener, in standing than in draw kilns; in the drawing of which, the stones are liable to hang, round the fides of the kiln; those in the middle running down, in the form of a tunnel; thereby mixing the raw with the half-burnt stones. The consequence is, the outfide stones are burnt too much, the infide ones too little; the stones, too frequently, running down to the eye, in a half-burnt Secondly, the unevenness of surface, left by this method, together with the obscurity caused by the smoke, render the filling difficult; under-burnt stones, or an unnecesfary waste of coals, is the inevitable confequence. A third argument in favor of standing kilns is, that a greater proportion of well burnt lime may be produced, from the fame quantity of coals. It is allowed that more kindling fuel is requifite; and, at the bottom, a greater proportion of coals; but han it

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the fire, by this means, getting a strong head, a less proportion of coals is required, in the body of the kiln; and what, perhaps, is of still more consequence, less heat is lost at the top of this, than of the draw kiln; which is always uncovered, and too frequently hollow and full of cracks; while the top of the standing kiln, being piled up in a conical form, and closely covered with sods or rubbish, collects a greater body of fire, and keeps in the heat more effectually.

One circumstance, however, relative to the standing kiln, requires to be mentioned. The inside should be lined with brick. For every time a kiln, which is lined with limestone, is suffered to go out, a shell of lime peels off the inside; by which means the walls are soon impaired.

The lime is drawn out at the "eyes," with a shovel, and generally carried out in scuttles, or in basket measures, to the cart or waggon:

Of a living kiln, the drawing is generally continued, until ted ashes begin to make their appearance. But standing kilns are suffered to burn undisturbed, until the fire go out; except, perhaps, when the fire is rising toward the top, and a fresh supply of air is

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wanted, a few shovelfulls are drawn at either eye, by which means a degree of hollowness is formed, and fresh vigour given to the fire.

From these circumstances, it is plain, that a regular supply of lime cannot be had, from less than three standing kilns: one filling; one burning; one drawing. The smaller burners, however, have frequently only two; and, for a farmer, one, proportioned to his farm, is sufficient \*.

3. Cost and PRICE. The ordinary wages for the whole labor of raising, breaking, filling, and drawing, is 18d. to 20d. a chaldron.

At MALTON, the labor, if taken by the gross, is about 18d. The price of "lime-kiln

About Brotherton and Nottingley, near FERRY-ERIDGE, from whence immense quantities of lime are sent, to distant parts of the Vale of York; particularly toward Easingwood; the kilns are very shallow and wide; the cone of materials piled above the surface, being, to appearance, equal to the contents of the kiln. This renders the emptying of the kiln very easy; the lime being all thrown from the surface, or through a kind of door-way in the side; not drawn out of the eyes; which are in this case, of no other use than to kindle at, and to admit a supply of air. Those kilns are much less expensive than the kilns of this District; and more convenient. But query, Do they give as much heat, with the same quantity of coals, as a taller more cylindrical kiln?

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kiln" coals, with carriage from the keels to the kiln, about 14s. a chaldron (of thirtytwo bushels) the produce, better than three for one. The whole cost about 6s. the selling price 7s. a chaldron.

At Pickering, the labor is 20d. a chaldron: the price of "moor coals" and carriage 16s. of "Malton coals" and carriage, 18s. The produce, if sufficiently burnt, three for one. The mean cost is therefore about 7s. 6d. the felling price 8s. a chaldron. The building and repair of kilns; the wear of tools; the value of the stone in the quarry; and, in some cases, the carriage of it from thence to the kiln, are drawbacks upon the profits, which appear in the above calculations. If therefore the stones be sufficiently burnt, the neat profit is, in this case, very small \*.

## Y 3 4. APPLI-

\* Nothing, perhaps, would encrease the profits of limeburning, in this place, more, than the kiln being filled by the hand of the master, or some judicious person, not interested in a waste of coals. It is the interest of men, who burn by the chaldron, to underbreak the stones, and to make up the deficiency of labor with an increase of coals; which, likewise, will make up for neglect, or want of judgment, in filling. Let the stones be raised and broken by the chaldron, or the kiln; but let the filling be done by 4. APPLICATION. It has already been observed, that lime is applied, indiscriminately, to every species of soil.

On the higher drier lands, its utility is evident.

At Malton, it is laid on a calcareous foil, with fuccefs.

In a comparative experiment, fairly and accurately made, on a redstone soil above Pickering, with three chaldron of lime an acre; the value of the lime, to the first crop, wheat, was not less than two quarters, an acre, and the succeeding crop of oats, (which now are upon the ground, Aug. 1787.) is a still stronger evidence of the great utility of lime, in some cases: in this case, the crop is at least threefold.

Nevertheless, it may be prudent in the occupiers of the cold moist clays, in the bottom of the Vale, to lime with caution.

Its use to the loose sandy soils of the West Marshes is, I believe, fully established; yet, in a comparative experiment on a black moory soil, on clay, its effect has thus far (the third crop) been detrimental, rather than useful.

It

women and boys; by which means industry will be encouraged, and the stones, by passing under the master's eye, will of course be rejected, if not sufficiently broken. It is not my intention to damp the spirit of improvement, but to endeavour to direct it to suitable objects. Nothing, at present, but comparative experiments can determine the value of a given lime, to a given soil; and no man can, with common prudence, lime any land, upon a large scale, until a moral certainty of improvement has been established, by experience.

The prevailing CROP is wheat on fallow. It is also pretty generally set on, for rape, turneps, or other crop, after sodburning, and spread among the ashes. It is also, not unfrequently, set on for barley. But its effect, to the sirst crop, except of wheat or rape, is, I believe, seldom perceptible.

But beneficial as lime undoubtedly is, in some cases, to corn, its benefit to grass is a matter in dispute, even among the farmers of Yorkshire. Incidents are authenticated in which, to general appearance, it has been detrimental.

But without the affishance of comparison, the judgment is at a loss to ascertain, with any degree of precision, the effects of Manures. Nevertheless, general appearances, to those who have a knowledge of the nature of the soil, have their weight.

It seems, however, to be a generally received idea, that lime, which is laid on for grass, is not thrown away; for, whenever the land is again turned up, its benefit to corn will have full effect. See NAT. HERB.

5. LIMING. Long as lime has been in common use, as a manure, the proper method, of applying it to the soil, is far from being universally practised.

The methods of liming are various.

The worst is that of laying it in large heaps, and suffering it to run to jelly, before it be spread upon the land.

Next to this is fetting it about the land, in finall billocks; for although these hillocks be spread, before they approach the state of mortar, this method is injudicious.

Lime, which falls in the open air, does not fall to powder, but breaks into checquers, or small cubical masses; which, being once buried in the soil, may remain in it, for ages, without being mixt intimately with it.

As far as experience and theory have yet reached, lime ought to be spread in a state of. PERFECT POWDER, and be mingled, intimately with the soil; and thus, by assimilating the two ingredients, form with them one homogeneous, calcareous mass.

A fingle stone, exposed to a moist atmosphere, falls into fragments, not into powder \*. The smaller the heaps, the nearer they approach to single stones; there is a greater proportion of furface, and consequently a greater proportion of fragments.

It is therefore the practice, of judicious husbandmen, to set lime upon the land, in LOAD HEAPS, and spread it over the soil out of carts, as soon as it is sufficiently fallen.

There is an instance of practice, in this neighbourhood, and, I believe, only one, which is still superior to that last mentioned. In this instance, the load heaps are turned over, not so much to finish the falling, as to gain an opportunity of burying the granulous surface of the heaps; by which means the fragments are at least lessened, if not reduced to powder.

In the MORELANDS, a still better practice is said to prevail. There, the heaps are interlayered, and covered up, with moist "turfmold"

<sup>\*</sup> It is observable, however, that much depends upon the nature of the stone, from which the lime has been burnt. Stones of a uniform texture, as most marbles, are less liable to fall in granules, than stones which are naturally composed of grains, or are divided by siffures into natural fragments.

mold" (the rubbish from peat and turf fuel), which bringing on a rapid fall, the whole is fet on fire, and the surface kept free from granules, by a covering of dry ashes,

This leads to a general IMPROVEMENT in the method of SLAKING LIME: Cover up the heaps, whether large or small, with soil, either of the field they are set in, or that of lanes or ditches, carted to them for the purpose; and, if a speedy fall be required, throw water over this covering. See Art. CEMENT, page 112.

- 6. TIME, &c. OF SPREADING. If lime be used on fallow for wheat, it is generally spread on, in July; good farmers making a point of harrowing it in, as fast as it is spread, and plowing it under, with a shallow surrow, as soon as convenient.
- 7. The usual QUANTITY set on is three to four chaldrons an acre.
- IV. DUNG. Nothing sufficiently noticeable, respecting this species of manure, has occurred to me; excepting some incidents relating to the manuring of grass land, which will appear under the head NATURAL HERBAGE; and excepting a general deficiency in Farm-yard Economy, for which see FARM-YARD MANAGEMENT.

SEMINATION.

### 10.

# SEMINATION.

THE SPIRIT OF IMPROVEMENT may have led some gentlemen, but, I believe, not one yeoman, or regular-bred farmer, to make experiments in the DRILL HUSBANDRY; at least, not of late years. In the day of Mr. Tull, some trials were made of it; but the results were not sufficiently favorable to establish it as a practice.

A fingularity in the method of sowing BROADCAST is noticeable; though not peculiarly excellent. The common way is to go twice over the ground, sowing half the seed one way, and (returning on the same land) half the other; the seedsman, in this case, filling his hand at one step, and making his cast at the next. But, in the method under notice, he casts at every step, and sows the whole of the seed, at once going over. This method is more expeditious, than the common way; but it requires a steady eye, and an expert hand, to seed the ground evenly,

WEEDS.

### II.

# WEEDS and VERMIN.

may have led frame gentlement, but, I believe

OTTIVITIES

I. SPECIES OF WEEDS. There are, in this District, men who have been singularly observant, with respect to the nature of weeds; marking their continuance, and describing their methods of propagation and rooting, with more than botanical accuracy.

What I principally propose, under the present head, is, to enumerate the species of weeds most noxious to the ARABLE LAND of this neighbourhood, and to note what appears to be worthy of notice, respecting the different species.

It may be proper to say, that in arranging the species I have endeavoured to place them according to their DEGREES OF NOXIOUSNESS; whether it arise from their respective qualities, or from the quantity which prevails, in the neighbourhood of Pickering. The GRASSES and the shrubs are purposely kept separate, to

shew,

shew, with greater perspicuity, their several degrees of hurtfulness, to the arable lands of the District under observation.

Provincial names. Linnean names. English names. Common thistle.—ferratula \* arvensis,— corn thistle.

Docken, -rumex crispus, -curled dock.

Nettle, -urtica dioica, -common nettle.

Swine thiftle, - fonchus oleraceus, -- common fow thiftle.

Wild oat, -avena fatua, -wild oat.

Runsh,-finapis arvensis,-wild mustard.

Runsh, - raphanus raphanistrum, - wild ra-dish.

Runsh, -brassica napus, -wild rape.

entela auforma, -- inversiced.

Dea-nettle,-galeopsis tetrabit,--wildhemp.

Hairough, - galium aparine, - cleavers.

Groundfil,-fenecio vulgaris,-groundfel.

Chicken-

racy. Linneus, whose system is a wonderful exertion of the human mind, with respect to accuracy of arrangement, appears to have made an evident mistake, in the classification of this common plant. How he could be induced to tear it from its natural family CARDUUS, and force it into that of serratula, may now be difficult to be ascertained. I retain the name,—but protest against the propriety of it. The LINNEAN NAMES are now gone forth, throughout all nations; and whoever changes them is speaking a language unknown to UNIVERSAL BOTANY.

Provincial. Linnean. English.

Chicken-weed, -alfine media, -chickweed.

Dog-finkle,—anthemis cotula,—maithe weed.

Dog-finkle, matricaria chamomilla? -- corn camomile.

Cup-rose,—papaver rbæas,--round smoothheaded poppy.

Cup-rose,-papaver dubium,-long smoothheaded poppy.

Bur thiftle,—carduus lanceolatus,—spear-thiftle.

Red thistle, \_\_carduus palustris, \_\_marsh-thistle.

Swine thiftle, - fonchus arvenfis, - corn fowthiftle.

Crowfoot, --- ranunculus repens, -- ereeping crowfoot.

Foal foot,—tussilago farfara,—coltsfoot.

potentilla anserina,—filverweed.

Fat hen, - chenopodium album, - commongeosefoot.

Fat hen, -chenopodium viride, -redjointed goofefoot,

Popple,—agrostemma githago,—cockle.

Stoney-hard, — lithospermum arvense, — corn gromwell.

Corn bind, polygonum convolvulus, climbing buckweed.

Sour-

Provincial. Linneau. Englift.

Sour-docken,—rumex acetofa,—common forrel.

Sour-docken,—rumex acetofella,—sheep's forrel.

Great horseknobs, — centaurea scabiosa, — corn knobweed.

Great blue-caps, - scabiosa arvensis, - corn scabious.

Cuishia, — beracleum sphondylium, — cowparsnep.

chryfanthemum segetum, -- corn marigold.

Yer-nuts, - bunium bulbocastanum, - earth nuts, or pig nuts.

daucus carota,—wild carrot.

centaurea cyanus,—bluebonnet.

trifolium melilotus-officinalis, — melilot.

trifolium alpestre,—alpine trefoil.

Docken,—rumex obtufifolius,--broadleaved dock.

Docken,—rumex fanguineus,—bloody dock.

carduus nutans,—nodding thiftle.

carduus eriophorus, ---- woollyheaded
thiftle.

thlaspi campestre,—common mithridate.
lapsana communis,—nipplewort.
polyganum persicaria,—common persicaria.

Provincial. Linnean. English.

polyganum aviculare,—hogweed.

mentha arvensis,—corn mint.

chrysanthemum leucanthemum,—oxeye

daisey.

ranunculus arvensis,—corn crowfoot.
ranunculus acris,—common crowfoot.
cucubalus beben,—bladder campion.

Cornbind, — convolvulus arvensis, — corn convolvulus.

achillea millefolium,-milfoil.

Saxifrage, — peucedanum filaus, — meadow fassafras.

lycopsis arvensis, -corn buglos.

Bur-docken,—arctium lappa,—burdock.

antirrbinum linaria,—common snapdragon.

valeriana locusta,—corn valerian.
reseda luteola,—weld.

Breckens, pteris aquilina, fern.

Crake-needle, — fcandix petten-Veneris, — hepherd's needle.

veronica bederifolia, -ivyleaved speedwell.

cerastium vulgatum, — common mouse-

fumaria officinalis,—common fumitory. euphorbia helioscopia,—sun spurge.

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B

Provincial. Linnean. English.

anagallis arvensis, — pimpernel.

filago germanica, — common cudweed.

euphrasia odontites, — red eyebright.

bypochæris radicata, — longrooted hawkweed.

myosotis scorpioides, — scorpion mouse-

viola tricolor,—common pansie.
prunella vulgaris,—selfheal.

Quicks, -triticum repens, -couchgrass. festuca duriuscula, -hard fescue.

White grass, bolcus mollis, couchy foft grass.

avena elatior,—tall oatgrass.

agrostis alba,—creeping bentgrass,

alopecurus agrestis,—field foxtail.

Droke,—lolium temulentum,—darnel. dactylis glomerata,—orchardgrass.

White grass, — bolcus lanatus, — meadow softgrass.

Ah, -fraxinus excelfior, -ah.

Aspen, populus tremula, trembling popular.

White thorn, - eratægus oxyacantha, -

Black thorn,—prunus spinosa, — soethorn. Vol. I. Z Briar, Provincial. Linnean. English.
Briar, rubus fruticosus, common bram-

rubus cafius,—dwarf bramble.

Cat whin, -rosa spinosissima, -burnet rose.
Rustburn, -ononis arvensis spinosa, -thorny
restharrow.

Rustburn, - ononis repens, - trailing rest-

II. THE MEANS OF EXTIRPA-TION. There are two ways of extirpating weeds from ARABLE LAND: by fallowing, and by weeding.

1. By the term FALLOWING, is meant repeated plowings, harrowings, &c. between the crops; whether these plowings, &c. be given in two, in twelve, or in eighteen months.

There are several species of weeds, which cannot be wholly overcome, without fallowing. Weeds, which propagate their species, by SUCKERS FROM THE ROOT, are invigorated, by a *single plowing*; which, by giving a fresh supply of air and openness to the soil, gives freedom to the suckers; and, by destroying the seed weeds in the operation, the suckers are left in possession of the soil; and whoever attempts to overcome root weeds with

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with the boe, may be faid to be unacquainted with the practice of husbandry.

The CONTINUANCE of a fallow, and the number of plowings requifite, depend on the feason, and on the number and the nature of the weeds, to be destroyed. If the spring season be found insufficient to effectuate the purgation,—take the summer, and even the autumn, the winter, and the ensuing spring, rather than crop an under-worked fallow, which is but little superior to a single plowing. One stirring, towards the close, is frequently more valuable, than two or three plowings at the outset. To begin a fallow, without continuing it, until its intention be fully accomplished, is throwing away labor, unprofitably.

2. By WEEDING, is meant the act of deftroying or checking weeds, while the crop is growing, to prevent their preying upon the foil, and propagating their species by seeding; whether the operation be performed with the boe, the spadle, the book, or the band alone.

Next to the plow and harrow, the HOE is the most destructive to feed weeds; but the hoe ought not, in any case, to be relied on: the HAND, alone, ought to give the finish to weeding: and the *later* this is given, so that the crop be not materially injured by the operation, the more valuable will be its effect.

The close of this operation is fimilar to that of the fallow. One additional weeding is given at a small expence; and without it, perhaps, those which preceded were of little benefit. One weed left to spread its seeds, this year, may be the cause of a hundred, the next.

III. VERMIN. The different species of vermin, which have more particularly excited notice, in this District, are,

- I. Mice.
- 2. Rats.
- 3. Dogs.

1. MICE. The mouse rivals the sparrow, in mischievousness toward the farmer. In the field, the barn, and the dairy, mice are equally troublesome and destructive. In the field, the quantity of destruction is not easily to be ascertained; but it is probably much greater, than the unobservant are aware of. At seed time, and at harvest, they not only feed freely upon corn, but fill their granaries with it, as a resource in less plentiful seasons\*.

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See MID. ECON. MINUTE 26. for a remarkable in-

Much care is bestowed on the destruction of moles; and it might be worth while to endeavour to lessen the number of field mice, which, I am of opinion, are in their nature more injurious to the farmer than moles are.

In the rick yard, the barn, the dwelling house, the garden, and the nursery ground, their mischievousness is too obvious to be overlooked, and the utility of lessening their number, in these places, is too well known to require an enumeration of facts to prove it.

The method of destroying mice is a subject, not unworthy of the attention of any man, who is interested in rural affairs. If some art, or some natural enemies, were not employed, in lessening their number, the entire supply of human food would not be sufficient to support them. Even in their present state, I have heard it intimated, by a man whose observations are frequently just, that it is a disputable point, whether the mouse or the tithe man is a greater enemy to the farmer \*.

Z 3 The

<sup>\*</sup> This idea, however, is more applicable, in a grass land country, where corn, being less in quantity, is more hable to be destroyed by mice, than it is, in an arable country, where

The barn and the stackyard are usually put under the care of the cat: to set a mousetrap, in a barn sull of corn, has generally been considered as a thing so unlikely to be estective, that it has seldom perhaps been tried: I have never met with an instance of it; excepting one in this District; in which its success has been extraordinary. A barn, which for many years had been remarkably insested with mice (notwithstanding a numerous guard of cats), has, by a proper use of traps, been kept in a manner free from them.

It having been observed, during long experience, that these mischievous animals, uncontented with their destruction among the corn, — attacked leather, grease, or other animal food, which happened to be lest in the barn,—traps were set in their runs, and hiding places, and baited with these substances. The success was every thing to be desired; for although a total extirpation has not taken place, an annual saving of some quarters of corn has been the consequence.

Under

where the proportion of corn is greater; where the barn is oftener emptied; and where pillar stack-frames, and pillar granaries, are generally more in use.

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Under an idea, that it was a CHANGE OF FOOD which, in the barn, constituted the bait, the same principle was applied, in the cheese chamber, and with the same success. Here, traps, baited with corn, were taken with avidity.

In the garden, it was observed, that much depended on the season of the year: therefore, here, natural hiding places were sought for; and if convenient ones could not be sound, artificial ones were made, in different parts of the garden; with logs, stones set up hollow, on-edge, boards, &c. In these hiding places, a variety of soods are laid, for several days, whenever mice become troublesome; and whatever food is preserved, with that traps are baited.

By these means, the entire premises have been kept almost wholly free from mice.

While the number is great, various kinds of traps may be used, provided they be properly baited: for taking a remaining artful few, the common steel trap, adapted to the size of the mouse, has been sound to be the most effectual.

2. RATS. This animal, equally artful and mischievous, is difficult to be taken by stratagem:

tagem: in farm homesteads, situated near water, it is become almost impossible to keep down their numbers. In every country, they are a growing evil; not only in Rural Economy, but in manufacture, and in domestic life. Should their numbers continue to increase, with the same rapidity they have done since the present breed got sooting in the island, they will, in no great length of time, become a serious calamity. They are, perhaps at present, an object of public attention.

3. Does. It is not through an antipathy to dogs, that I class them here among vermin. I am led to it, by facts, which, though not extraordinary, ought to be generally known.

A few years ago, the whole country was alarmed, with the apprehension of CANINE MADNESS. A confiderable proportion of the dogs, kept in it, were actually mad. Much live stock, and several persons, were bitten. Fortunately, however, thus far, none of these have been attacked, by that horsid disorder; but they still live under the dreadful apprehension of their being, every day, liable to be seized,

feized, by the greatest calamity human nature is liable to \*.

In the course of last winter (1786-7) the value of SHEEP WORRIED BY DOGS, in this township alone, was calculated at near one hundred pounds. A small farmer, whose entire stock did not amount to more than forty, had thirteen sheep, and eleven lambs, worried in one night.

Thefe

\* Since writing the above, no less than seven persons were, in this place, bitten by one dog! Much live stock has also lately been bitten. In a neighbouring village a calf, which had been bitten, was seized with madness, and bit the person who had the care of it.

What aggravates the first-mentioned instance is, that the person, to whom the dog belonged, knew that he had been bitten, a sew weeks before, yet suffered him to go loose, though urged to the contrary. Surely, on culprits like this, some severe penalty, or some severe punishment, ought to be inslictable. A general law against every man, whose dog is suffered to stray, in a state of madness, might have a good effect.

If the practice of worming be really effectual, in preventing the mischiefs of canine madness, a severe penalty is due from every owner of a dog, which has not undergone so falutary an operation.

Several instances are related of persons, to whom canine madness has proved satal, in this neighbourhood. And the instances of live stock, which have suffered by the same means, are innumerable,

These are not mentioned as singular facts: every District, and almost every year, afford instances of a similar nature; nor do I mention them to excite a momentary indignation, in the breast of the reader; but in hopes that they may be instrumental, in rousing the humanity, of those, who have it in their power, to mitigate the danger, and lessen the

quantity of evil.

The quantity of human food, which is annually wasted on useless dogs, is itself an object of national attention. When the horrors of canine madness, the wanton torture of innocence, and the wanton destruction of one of the first necessaries of life are added, the object becomes of the first concern to the nation. Who, even in these days of Public Economy, would think ten thousand pounds a year ill bestowed, in doing away fuch an accumulation of public evil? Yet who does not know that, in doing it away, ten times ten thousand a year might be drawn into the national treasury! not the patriotism of Princes, the ability of Ministers, or the wisdom of Parliament, be fpoken of, in this country, until a NATIONAL ABSURDITY, fo glaringly obvious, be removed.

There

There are men whom friendship inclines to the cause of the dog. Far be it from me to damp the slame of friendship. But is not the lamb equally, at least, entitled to our friendship? Who sees the little innocent dragged to the slaughter without regret; and who, without remorse, could see one lying mangled in the field, half alive, half eaten up, by the merciless, yet befriended dog?

But the operation of a tax upon dogs would, probably, be different to what is generally conceived. I am of opinion, that, were such a tax to be laid on judiciously, the immediate destruction of dogs would be inconsiderable. The tie of affection must be weak which a shilling, a year, would dissolve: even the poor man's dog would die a natural death, under those easy circumstances.—But what poor man would think of paying, even a shilling a year, for a dirty troublesome puppy, for which he had not yet conceived any particular affection? Thus the number of dogs would, annually, and imperceptibly, decrease.

In fix or feven years, the tax would require an advance: its productiveness would be lessened, and the rearing of another class of

dogs

dogs would require prevention. In a few years more, it might receive its final advance.

The productiveness of the tax ought not to be considered, as the primary object of a tax upon dogs. The removal of the public evils, which have been enumerated, should be at least jointly considered. Five shillings a head would reduce the number of dogs; and would, perhaps, be found, on experience, to be more productive than a lower tax.

## I 2.

# HARVESTING.

NO DEPARTMENT of Rural Economy distinguishes the NORTHERN, from the MID-LAND, and SOUTHERN parts of the Island, so much, as the method of Harvesting. And, perhaps, no Northern District is more strongly marked, with this distinguishing characteristic, than that which is now under survey.

- 1. Cutting corn with the fickle,
- 2. Cutting corn with the fithe.

I. THE

I. THE SICKLE. It is probable that nine tenths of the corn, which is cut with the fickle, in this kingdom, is cut by men. In Surrey and Kent, a woman may formetimes be feen with a fickle in her hand. In Norfolk, it is a fight which is feldom or ever feen. Here, it is almost equally rare to fee a fickle in the hand of a man; reaping—provincially, "shearing,"—being almost entirely done by WOMEN.

Three women and one man make a fett; who, of a middling crop, do an acre, a day. If corn be thin, a man will bind after four women; if very thick upon the ground, he requires a boy to make bands for him.

Sometimes, the bands are laid for the women to throw their handfuls into; but, in general, they lay the corn in "reaps," of about half a sheaf each; the binder gathering it up carefully, against his legs, in the manner wheat straw is usually gathered on the thrashing sloor. This is much the best way (though somewhat more troublesome); the corn being, by this means, bound up tight and even, and the sheaves made of an equal size.

The day wages of a woman, in harvest, is tod. of a man 2s. Thus wheat, which in Surrey

Surrey would cost 10s. to 12s. and which, in any country I have observed in, would cost 7s. or 8s. is here cut for 4s. 6d. an acre.

But the faving of so much, an acre, is far from being the only advantage, arising from the practice of employing women in the work of harvest. The number of hands is increased; the poor man's income is raised; the parish rates are in consequence lessened; and the community at large are benefited, by an increase of industry, and an acquisition of health. How conducive to this are the employments of husbandry, compared with those of manufacture! And the work of Harvest, so far from being thought a hardship, is, by women who have been bred to it, considered as a relaxation to domestic confinement, and less agreeable employments.

Whear and Rye are set up in shucks,—
provincially "stooks,"—of twelve or ten
sheaves each; two of which are invariably
used as "hood-sheaves"; for hooding, capping, or covering the heads of the rest.
Twelve sheaves are termed a "stook;" in
which wheat, formerly, was generally set up;
but unless the straw be long, two sheaves are
not equal to the safe covering of ten. It is
therefore, now, the more general practice, to

fet them up in "tens;" by which means they are much more effectually covered.

In the fouth of England, the covering of wheat is never practifed; here, wheat is never left, a day, uncovered. Both practices are wrong. In fine weather, the ears of corn cannot be too much exposed to the sun and dews; if the grain be thin, even a slight shower is of great benefit to it. In a rainy season, they cannot be covered too closely. Therefore, in the covering of wheat, as in other departments of husbandry, the farmer ought to be directed by the season; not by any bigot custom of the country he happens to farm in.

II. SITHE. In the southern and midland provinces, corn is invariably mown outward, and dried in swath. Here, it is as invariably mown against the standing corn, and dried in sheaf.

The method of sheafing varies. Upon the Wolds, the prevailing method is to bind the sheaves, in the usual banding place, and to set them up, in "stooks." This is termed "binding;"—a practice which appears to be encreasing in the Vale.

But formerly, the invariable practice was, and the prevailing practice still is, here, to tie them them near the top, and set them up in fingle sheaves, — provincially, "gaits." This is called "gaiting;" which, if the corn be weedy, or full of cultivated grass at the bottom, is a most admirable practice.

of three points (fimilar to that of two points used in Kent, and in mowing corn into swath) is generally placed over the sithe, to collect the corn, and assist in setting it up straight, but somewhat leaning, against the standing corn. If corn stand fair, a man who knows how to set his cradle, and use his athe, will set it up with great evenness and regularity. If corn be somewhat disordered, yet mowable, a bow (similar to that used in most countries for mowing corn outward) is affixt to the sithe, for the same purpose.

The mower is followed by a woman, who makes bands, and "lays out" the corn into sheaf. This she does, either with the hands alone, or with a short-headed, long-toothed wooden rake: gathering the corn with the rake; and, when a sheaf is collected, throwing it dextrously into the band, with her foot; without touching it with her hands; and, consequently, without the inconveniency of stooping.

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Stooping. If the crop be large, the woman has generally a boy to make bands for her.

A man, or a stout boy, follows to tie and set up the sheaves; or, if the crop be thin, one man binds after two sithes.

2. SETTING UP SINGLETS. To do this properly, and expeditiously, there is an art and dexterity requifite, which can only be learnt from practice. The band being loofely tied, at about the same distance from the head of the sheaf, as it usually is from the butts,—the binder lays hold of the ears, with both hands, immediately above the band, and strikes the sheaf down pretty hard upon its butts; in order to give it a flat even base. One hand (the right for instance) is then loofened, and inferted edge-way into the middle of the butts. The body, with the arms in that posture, is thrown forward, and brought round with a fweep to the right; thereby fpreading the butts of the right-hand fide of the sheaf. The situation of the hands is then changed: the right is placed upon. the ears, the left within the sheaf, bringing them round with a sweep to the left, leaving the sheaf a bollow cone.

If the face, in this operation, be turned toward the north, and, in the last sweep, an Vol. I. A a opening

opening or breach be left toward the fouth, the rays of the fun will have admission, to keep the ground dry within, and affist the wind in drying the inner side of the sheaf.

These particulars may, on paper, appear tedious; but, in practice, an expert hand will go through them in a few seconds of time.

There is, however, a much readier way of setting up single sheaves; namely, by lifting them as high as the arms will conveniently reach; and bringing them smartly to the ground, with a jerking motion. This spreads the butts; but does not give the desirable bollowness; nor the sirmness, which is requisite in windy weather.

When the finglets are dry enough, for carrying, they are "bound," in the usual banding place.

3. In BINDING SINGLETS, the band is laid upon the ground, about a foot from the skirts of the singlet; which is pulled over upon it, and bound in the common manner. The original band of the first sheaf is pulled off for the second; so that, without an accident, the first band, only, is required to be made, at the time of binding. This renders the operation less tedious than theory may suggest.

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The sheaves, when bound, are collected into heaps, and carried on the day of binding; or are set up in shucks, as accidents or conveniency may require \*.

4. If the corn be "BOUND," AT THE TIME OF MOWING, it is fet up in shucks; in which it stands until it be fit for carrying.

This is less troublesome, than first "gaiting" and afterwards "binding" it. And if the corn be ripe, and the bottom be tolerably free from weeds, it is, perhaps, the more eligible method, for corn which is cut with the SITHE.

But, for under-ripe, or weedy corn, though cut with the fithe; and for all oats and barley which are cut with the SICKLE; "gaiting" is here confidered, as effentially necessary. Corn

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\* GAITING. This practice is probably of Scottish extraction. In the dialect of the English language, now used in the Highlands of Scotland, where this practice is much in use, "GAIT" is the ordinary name, (or the established pronunciation,) of the GOAT. In the dialect of the Celtic language, likewise in use there, single sheaves set up, as in this practice, are called GOURACS;—from gour, a goat,—gourac, a little goat;—the diminutive of gour.

Hence, there seems to be little doubt of the name having been taken from the animal. But whether the Saxon Scots borrowed the practice, and the name, from the Celts, or the Celtic Scots from the Saxons, may, now, be difficult to trace.

eut with the sickle lies straighter, and closer, in the band, than mown corn; which, being more or less russled, with the sithe or the rake, does not bed so closely in the band; the air thereby gaining a more free admission, into the center of the sheaf.

If barley be short upon the ground, free from weeds, and well headed (especially the four-rowed barley or "big"), it is difficult to be "gaited;" the heads of the sheaves being too bulky, and the butts not sufficiently so, to form a basis broad enough to support them. Its slippery nature, also, renders it difficult to be kept in a loosely tied band. Barley, therefore, is more commonly bound after the fithe, than oats are. But when it runs much to straw, and is weedy, or full of graffes at the bottom, gaiting becomes effentially necessary to accurate management. Barley is more liable, than any other grain, to take damage in the field; and every means of forwarding its drying, thereby shortening the length of time between the cutting and the carrying, ought to be employed.

Shucks of oats and barley, bound after the fithe, are generally left uncovered, until the time of carrying. If, however, the feafon be unfettled, and the heads be pretty well weathered,

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weathered, while the butts are yet under dry, it is well to put on hood sheaves, and thereby guard the grain from too great an exposure to the weather.

# GENERAL OBSERVATIONS ON HARVEST-

The COMPARATIVE ADVANTAGES of harvesting barley and oats, in sheaf, are numerous. The waste, throughout, is less; the corn, especially in gaits, is, at once, got out of the way of the weather; the labor of carrying, houseing, or stacking, is much lessened; much barn room is saved; the labor of thrashing is less; the straw, if the harvest prove wet, makes much better fodder; and, under this circumstance, the corn preserves its color, in sheaf, incomparably better, than it does in swath,

The apparent inconveniency of Harvesting corn in sheaf (I mean that which must strike every one who has not duly considered the subject, and compared the nature and the quantity of labor, separately, requisite to each of the two methods of Harvesting) is the increase of labor, at the outset. But if the laying out, and the binding, be done by

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women

women and boys, or by men who cannot mow (which is almost invariably the case) the business of mowing goes on the same pace, or nearly the same pace, as it would have done, had the corn been mown into swaths. Besides, the repeated turnings, which frequently are requisite, and the cocking, which always is necessary, are entirely excluded, by binding.

Upon the whole, it is evident, that the quantity of men's labor is diminished, not increased, by the practice of Harvesting in sheaf. If, to this advantage be added, the ease and expedition, in the business of carrying (the most important business of harvest, and that which requires the quickest dispatch), we may fairly conclude, that, by Harvesting in sheaf, the labor, the anxiety, and the hazard of harvest are lessened; while the quality, and consequently the value, of the produce is increased.

My own practice having been in Districts, where Harvesting, in swath, is the universal custom, I had conceived, that the practice of Harvesting, in sheaf, was only adapted to a country thin of corn; and that it was altogether impracticable, in what is called a corn country. But the wolds of this District leave

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leave no room for such a conjecture. The Yorkshire Wolds are not only a corn country, but the farms are many of them of extraordinary size: nevertheless, it is the invariable practice of that District to harvest barley and oats, in sheaf. One man, a few years ago, grew between three and four thousand quarters of oats and barley,—every bushel of which was harvested in sheaf.

I am too well aware of the difficulty of changing the custom of a country, to recommend to any man, who farms in a southern District, to attempt to harvest all his corn, in sheaf, without regard to the weather, or the state of the season. But I will not hesitate to recommend, to every man, who has barley or oats to cut, in a wet season, or in a late harvest, to harvest them in sheaf.

In Surrey, and other counties, where mown corn is laid straight in swath, there would be no difficulty in harvesting it, in sheaf. The corn might be mown outward, in the usual manner, and sheaved out of swath; which is, perhaps, upon the whole, a better method of sheafing, than that which has been described, as the practice of this District.

The great art of laying corn straight with the sithe, whether it be mown inward or A a 4. outward, outward, is to keep the face somewhat inclined toward the standing corn: thus, in mowing outward, the left hand and the left foot ought to go somewhat foremost: on the contrary, in mowing inward, the right fide ought to precede. Much depends upon fetting the cradle, or the bow; which should be so set, as to take the whole of the corn, cut at each stroke, without interfering with the standing corn. The fithe, in mowing, ought to be brought well round to the left, as if for the intention of throwing the corn behind the mower. To allow for this length of fweep, the fwath should not be taken too wide; nor, in ravelled corn, should the fithe be too long.

By a little practice, young men, who can handle their fithes, and whose dispositions incline them to oblige, might, in any country, soon be rendered sufficiently perfect, in the art of laying corn straight, in swath; or of setting it up straight, and evenly, against the standing corn. In exercising these, young women might, at the same time, be taught to lay out the corn into sheaves, and stout lads to set them up singly. A leisure opportunity should be embraced. The outset should be considered as a matter of amusement. A

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few acres, this year, might be an inducement to extend the practice to a greater number, the next. The art once acquired, it would be ready to be applied, on a large scale, whenever a wet season, or a backward harvest; should happen.

# 13.

# FARMYARD MANAGEMENT.

- I. BARN MANAGEMENT. The subdivisions of this subject, which are noticeable here, are,
  - 1. Binding the straw.
  - 2. Winnowing the corn.
- I. BINDING STRAW. Straw, of every kind, is bound upon the thrashing floor. This, when straw is not used at the time of thrashing, would, in any country, be good economy. Straw in trusses is much better to move, lies in less room, and retains its flavor longer, than loose straw does. In a country where cattle, in winter, are universally kept in the house, and foddered at stated mealtimes, the binding of straw be-

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comes effential to good management. Each trus—provincially, "fold"—contains an armful (that is, as much as the arms can conveniently fold); and this is the usual meal for a pair of cattle. Thus the business of "foddering" is facilitated, and a waste of straw avoided.

2. WINNOWING. Under the article IMPLEMENTS, the present practice of winnowing, with the "machine-fan," was mentioned. All that remains to be done, here, is to endeavour to give some general rule, for the method of using it.

Practice, only, can teach the minutiæ of the art, which, though here so prevalent, is far from being well understood. The complexness of the machine is such, that laborers, in general, are ignorant of the means of adjusting it; and let its construction be ever so perfect, much depends on regulating it, properly, for different kinds of grain; as well as in setting it, with truth, for any particular species.

The outlines of the art lie, in adapting the strength of the wind, to a due and regular supply of the given contents of the hopper; and in adjusting the several regulators, in such manner, as to separate the chaff, the capes,

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and the grain, with the greatest possible exactness.

Wheat is generally run twice through the machine or mill; but, with a good machine, properly regulated, and deliberately fed, it may be made marketable, by running it once through. Barley and oats are feldom put through, more than once. And beans or peas may be cleaned, as fast as a man can supply the hopper with them.

Superior advantages, of this species of fan, are dispatch, the saving of the labor of one man, and the preservation of the health of those who are employed. The fail fan,-the common winnowing fan of the kingdom at large,-requires one person to turn, one to riddle or "heave," and one to fill the riddle or scuttles; and, for this sett, seven or eight quarters of wheat is a hard day's work. Two persons, with a machine fan, properly set, and properly supplied, will winnow the same quantity, in half a day. The fan, itself, supplies the place of the person who riddles; and all the labor, which is necessarily bestowed, on the difficult work of separating the one continuous heap, into corn, chaff, and "capes," and running the intermingled parts down, again and again, to reduce them

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to one or other of those articles, is entirely faved.

II. YARD MANAGEMENT requires to be subdivided, in this case, into

- 1. Expenditure of straw.
- 2. Raifing yard manure.
- I. EXPENDITURE OF STRAW. Vale, and the Morelands, cattle are, almost univerfally, kept tied up in house s or hovels, or under sheds, which, if the aspect be good and the ends properly sheltered, are preferable to close houses. Warmth and dryness are doubtless of great advantage to cattle, in winter; especially to lean straw-fed cattle; which cannot bear the severity of weather, so well as cattle whose keep is higher. But, in this, as in most things, there is a medium to be observed. The hair of cattle, kept in a close warm house, naturally grows thin, and peels off, prematurely; exposing the cattle, when turned out to grass in the spring, to a degree of unnecessary hardship, which, in its effect, is perhaps frequently worfe, than expofing them in an open yard, in the winter months.

The warmth of the cattle, however, appears to be, here, only a secondary object: the SAVING OF FODDER seems to be the principal motive, for tying up cattle of every

kind,

kind, in winter; by which means, almost every straw is eaten; the cattle frequently lying without litter, upon the bare floors of their stalls. Twenty or thirty head of cattle are kept, here, on the fame quantity of straw, which, in most corn countries, is allowed to be picked over, by eight or ten.

The dung drops into a fquare trench, which is cleaned every day, while the cattle are out at water, or in the fields at grass.

Stalled cattle are usually foddered, four times a day: in the morning; again in the forenoon; a third time when they are taken up from watering; and, finally, in the evening. The best of the straw is given to the young stock, the inferior fort to oxen. Cows are chiefly kept on hay, even when they are dry of milk: an evident impropriety; especially when applied to the short-horned breed of cows, which generally calve with difficulty.

On a general view, it is evident, that the expenditure of straw, in this country, is adapted to its climature, and to its state of husbandry. Where grass land abounds, cattle of course are numerous, and straw proportionally scarce. On the contrary, in a cornland country, straw is more plentiful than ava to state the mile to a state fock;

stock; and all that is thought of, there, is to get it trodden into manure.

2. RAISING YARD MANURE. It would be foreign, to the present work, to canvals the propriety of treading straw into manure. This country has generally stock enough to eat every straw it produces; therefore to tread it to manure, and to waste it, are, here, synonymous expressions. It is all wanted as fodder, and it would be an evident absurdity to litter the yard with it. All I propose, at present, on this subject, is, to recommend to my countrymen a more provident management of the little yard manure they make,let its quality be what it may.

The general practice, at present, is to pile it on the highest part of the yard; or, which is still less judicious, to let it lie scattered about, on the fide of a flope; as it were for

the purpose of diffipating its virtues.

The urine, which does not mix with the dung, is almost invariably led off, the nearest way, to the common shore; as if it were thought a nuisance to the premises. That which mixes with the dung is, of course, carried to the "midden," and affifts in the general diffipation. A yard

A yard of dung, nine tenths of which is straw, will discharge even in dry weather, some of its more sluid particles; and, in rainy weather, is, notwithstanding the straw, liable to be washed away, if exposed on a rising ground.

But how much more liable to waste is a mixture of dung and urine, with barely a sufficiency of straw to keep it together, in a body? In dry weather, the natural oozing is confiderable; and, in a wet feafon, every shower of rain washes it away, in quantity. It may be a moot point whether, in some cases, half the essential virtues of the dung, as a manure, may not be loft by improper management. Certain it is, that, in all cases, much too great a proportion is loft; and it behoves the husbandmen of this District, and of every District where the housing of cattle in winter is practifed, to pay particular attention to the management of Farmyard manurera wol the Damagarus Cont

If a small proportion of the expence and attention, which has of late years been so well bestowed on the making of DRINKING POOLS, were to be applied to the forming of DUNG YARDS, the profits, great as they are

in one case, would, I am persuaded, be found still greater in the other.

The Norfolk method of BOTTOMING the dung yard, with mold, is here indispensably necessary, to common good management. There is no better manure, for GRASS LAND, than mold saturated with the oczings of a dunghill: it gets down quicker among the grass, and has generally a more visible effect, than the dung itself. To neglect so valuable a source of manure, is neglecting a mine of gold and silver, which may be worked at will. Under this management, the arable land would have the self-same dung, it now has; while the grass land would have an annual supply of riches, which now run waste in the "strands" and rivulets.

But, before a dung yard can, with propriety, be bottomed with mold, the bottom of the yard, itself, ought to be properly FORMED. A part of it, situated conveniently for carriages to come at, and low enough to receive the entire drainage of the stable, cattle stalls, and hog sties, should be hollowed out, in the manner of an artificial Drinking pool, with a rim somewhat rising, and with covered drains laid into it, from the various sources of liquid manure.

During

During the fummer months, at leisure times, and embracing opportunities of back-darriage, cover the bottom of the bason, a foot or more thick, with mold,— such as the scowerings of ditches, the shovelings of roads, the maiden earth of lanes and waste corners, the coping of stone quarries, or the soil of fallow ground,—leaving the surface dishing; and, within the dish, set the dung pile: equally preventing the admission of extraneous water into the reservoir, and the escape of that which falls within its area.

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### MARKETS and PAPER MONEY.

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but paper of no other value, than that

MARKETS. CATTLE and SHEEP are mostly sold in the MARKET TOWNS of the Vale. WHITBY and SCARBOROUGH take the surplus of such as are fit for the butcher; and those which are lean, are bought up by the south-country drovers. Malton is the principal market for borfes, corn, butter, Vol. I. Bb and

and bacon. Oats, ordinary butter, and bacon, find a market in the manufacturing Diffrict of WEST YORKSHIRE: prime butter, and fome bacon, travel, by way of Hull; to the METROPOLIS. Horses are divided between the Lendon and FOREIGN MARKETS

PAPER MONEY. An evil, which has been long growing in the markets of this kingdom, has here got to a height that entitles it to notice.

Goi o can no longer be confidered as the medium of property. Let a man fell his whole stock, at market, and it were mere chance, if he brought home with him more than a few guineas. The bulk of the value received is invariably PAPER :- not bank notes, -but paper of no other value, than that which is given it by the engraver, and the name, perhaps, of some shopkeeper, or other petty banker, wholly unknown to the farmer; who, probably, is entirely ignorant, as to whether the name, or names, be real or fice titious.

One accident has already happened, in this neighbourhood; and it is matter of aftonilha ment, that more do not follow: a circumia stance, which can only be accounted for, by the

the profite, which this species of coinage affords \*.

An arch cobler of Newcastle upon Tyne has made a fortune, by coining penny and twopenny notes †, which are highly embellished, and rendered valuable, by a long list of respectable names; his friend Crispin at the head of them. They are also payable in London, at a bouse of names, equally respectable and responsible: the finest burlesque upon modern banking, which can possibly be conceived. The fellow is said to have pocketed, already, a thousand pounds by the thought.

The conveniency of paper money few men will depy; especially, now, when the weighing of gold is become, in some degree, necessary: a business which is extremely aukward, in a market. All the farmer wants is security.

On the other hand, the profitableness of paper money, to those who coin it, is still B b 2 less

Not only by the interest of the amount of bills in circulation; but by dead notes; that is, bills lost and destroyed by accident; the amount of which is clear gain.

Circulated among the colliers, keelmen, and failors; every one being proud to have a "bank note" in his pocket.

less disputable. But why shall individuals be suffered to batten on the public, by the profits of COINAGE? Why shall one man be dragged to the gallows, for coining a sew shillings, while others are suffered to amass fortunes, by coining five and ten pound pieces? If paper money be political, the NATION, not individuals, ought to have the profits arising from it.

But the infecurity of paper money, and the crime of coining it, form only part of the evil, which is here meant to be held up to view. I pretend not to the profound in political arithmetic; but I have always underflood, that the prices of commodities, at market, bear a proportion to the quantity of money, in circulation. If this be in truth the case, the evil, here spoken of, has the most pernicious tendency.

In the present state of Europe, this country, can preserve its pre-eminence, as a nation, by manufactures and commerce, alone. The demand for the manufactures of a given country will ever bear a proportion to their comparative price. The price of manufactures depends upon those of materials and labor; and this on the PRICE OF LIVING. If by a flow of cash in circulation (no matter whe-

ther of gold, filver, copper, or paper) the prices of living, labor, and materials be fuffered to advance, the demand for manufactures will of course decline, and with it the prosperity of the nation.

I wish not to intermeddle, officiously, in concerns of Government; but the subject, under notice, seems to be sufficiently connected with RURAL ECONOMICS, to warrant its being mentioned, in this place.

1796. These PRIVATE COINAGES, since they were here first held up to public notice, have engaged the attention of Government. To suppress or check them? No. To give them countenance, and literally to stamp their baleful effusions with public avowal.

END OF THE FIRST VOLUME.

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